

POWER ON TRIAL DOES MAC MHZ REALLY MATTER?

# Macworld

MORE NEWS, MORE REVIEWS

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- Home networking • QuickTime
- Mac OS X secrets • Bryce 5
- Mono laser-printers tested



**Simon Jary**  
editor-in-chief

Why should Apple be ashamed of its world-famous logo adorning its QuickTime multimedia standard?

## Bananas split



**“I can’t see Steve Jobs wielding an axe to Apple, unless it’s to chop some bozo’s head off.”**

Apple is one of the world’s most recognizable brands – up there with Coca-Cola, Sony and David Beckham’s barnet. Its logo is as recognizable a badge of quality as Nike’s swoosh or Michelin’s tyre-man. Even to people whose only personal computer is their cash machine, Apple means innovation, quality and style.

Yet, according to at least one high-profile developer, the fact that QuickTime’s made by Apple is actually putting-off large-enterprise customers from using it.

As you’ll read on page 18, there are suggestions that Apple would do better to set QuickTime free – floating it off as a separate company that could expend every effort in taking it to its rightful place as the number-one multimedia-delivery technology on the Internet. Apple refutes this, saying that QuickTime is ahead of a game that’s only just begun, and that it will take first place away from RealNetworks’ RealPlayer before Microsoft’s proprietary Media Player steals a march.

But Apple hasn’t always been so keen to keep all its products under one roof. History tells another story, where a break-up could easily have occurred by now, and where future splits are quite possible.

Apple very nearly merged with giant American telecoms corporation AT&T in 1993. The plan was to create a dominant online multimedia company – in the same vein as AOL/Time Warner today. The deal collapsed, so then-CEO John Sculley proposed a bold plan to split Apple into two companies.

One half – the Macintosh Company – would handle the low-margin hardware business, building and selling Macs, much like Compaq and Dell shift PCs. The other half would be the Apple Company – in charge of software projects, such as Cyberdog and QuickTime.

Apple’s board of directors approved the plan, and an investment bank began preliminary work on the break-up. Apple made 95 per cent of its profits from hardware, so it was important to keep those revenues. But Sculley knew that a software company, unshackled from the hardware, would – just like Microsoft – be free to license its technology to whomever it chose.

Sculley’s plan was scuppered by a mutiny involving his most senior executives – none of whom wanted to work on the unsexy hardware side. Now that Apple’s hardware is as glamorous as Elton John’s wardrobe, there might be less opposition to such a split – but I can’t see Steve Jobs wielding an axe to Apple, unless it’s to chop some bozo’s head off.

Actually, Apple has successfully separated hardware and software in the past. In 1987, Apple created a new company to develop and sell its software programs – such as the ClarisWorks integrated suite of business

and education applications, Home Page, and some other now-departed programs, such as ClarisDraw.

Just as Claris was poised to go public, Apple swallowed it back into the main company – losing its inspired boss Bill Campbell in the process. ClarisWorks became AppleWorks, and has never really been the same since. Claris’s FileMaker, on the other hand, has gone from strength to strength as a cross-platform-solutions company. Apple also spun-off its Newton PDA team, but later pulled it back in, pushed it back out, and then wound the whole sorry mess up.

Clearly, it’s no smooth ride separating from Apple’s Cupertino motherhood. While I can see the benefits of an unfettered QuickTime, there seems little chance of this idea getting out of Steve’s secretary’s in-box.

At exactly the same time that people are urging Apple to spin-off some of its neat technologies, Microsoft is fighting fanged-tooth and nail-bomb to stay in one piece. While Apple is supposedly struggling to pay full-attention to its many related technologies, Microsoft is deemed monopolistic with its myriad of Windows operating systems, Office suites, flight-simulators, Web browser, email clients, development tools, encyclopedias, e-book reader, Web editor, page-layout tool, joysticks, and mice all under the one platinum-lined roof. Oh, and don’t forget the upcoming Xbox games console...

Microsoft recently overturned the US government’s legal judgement that the company be broken-up. Bill Gates and co. are still guilty of corporate mass-misdemeanours, but the court has now declared that Microsoft can remain in one highly successful piece.

In light of Bill’s ability to keep one eye fixed on Windows, and the other on either Golf 2001, Office XP, Age of Empires II or Xbox, why would Steve suppose himself unable to keep check of QuickTime at the same time as Mac OS X and Pixar’s *Monsters Inc.*?

Sure, QuickTime will grow only if it’s adopted by users and developers of Windows. But the facts that QuickTime was the first software-based multimedia solution and is still the best, that Microsoft slavishly copied QuickTime’s interface for its Media Player, that MPEG-4 is based on Apple’s technology, and that QuickTime is a whole lot more than a Web media player proves that Apple can still win the war, despite lagging behind at present.

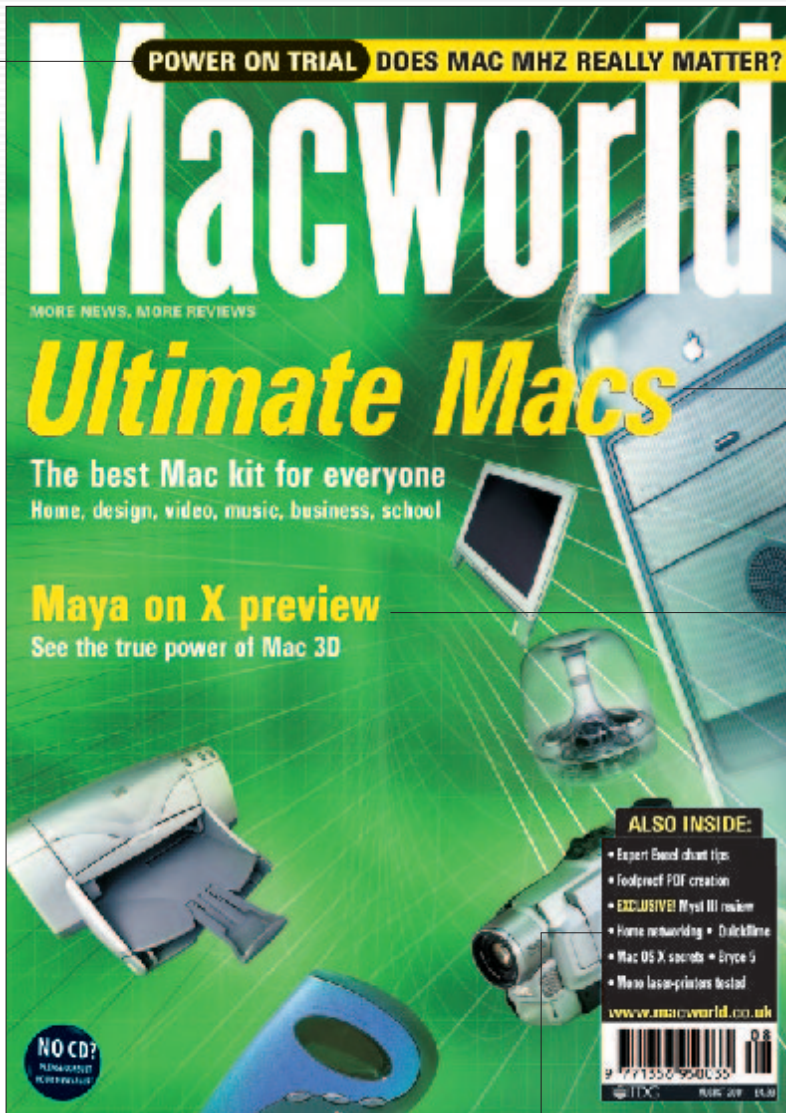
Apple should redouble its efforts to progress the multimedia standard – leveraging the full might of its world-renowned brand to project QuickTime into the consciousness of developers and public alike. The Apple brand is nothing to be ashamed of. It’s something to shout loudly from the roof tops.

NW



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Macworld is a publication of IDG Communications, the world's leading IT media, research and exposition company. With more than 300 publications in 85 countries, read by more than 100 million people each month, IDG is the world's leading publisher of computer magazines and newspapers, providing the answers buyers need to make purchase decisions.

IDG Communications, 99 Gray's Inn Road, London WC1X 8UT.  
Tel: 020 7831 9252. Sales fax: 020 7405 0262  
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ISSN 1356-9503  
Colour Origination: Lumis Colour Printed by St Ives (Plymouth). Covers printed by Hubbards (Sheffield) on paper produced in sustainable forests. Macworld editorial domestic Internet access courtesy of Netscalibur (0800 072 0000, [www.dircon.net](http://www.dircon.net)).  
Stock photography courtesy of Cadmium ([www.cadmium.com](http://www.cadmium.com))  
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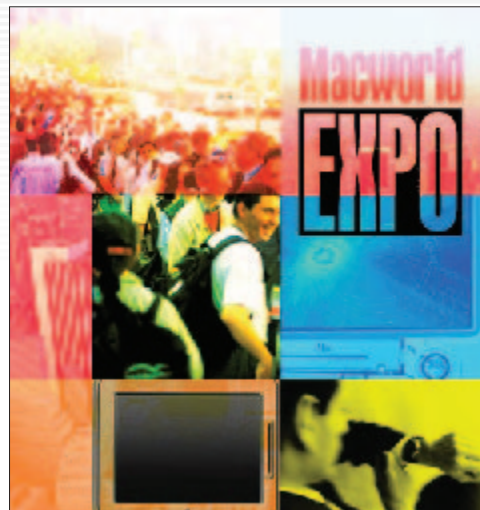


Macworld's ABC-audited circulation is 31,640 (July-December 2000).

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## Subject: Don't kill the Cube

I can't believe Apple is going to ice one of its most brilliant inventions – the G4 Cube. This machine sits on minimal real estate, functions with great stability at high speed, and defines an aesthetic untouched by any other computer.

This sophisticated device should have started a revolution in computer design. Instead, a sleeping public and unappreciative reactionary critics gave it the cold shoulder.

I was looking forward to the next generation of Cube. Please, Apple – add some slots, option a subwoofer, shrink it, take it to the next level, but don't abandon this wonderful product.

*Richard Goldweit*

## Subject: Legacy shut-out

Is it me, or has my lovely 16-year-old Mac OS suddenly become more PC than a PC? What about the millions of Macs that can't run OS X? Does development for them stop dead?

As a Mac engineer, I regularly come across people who are superb program operators, but don't know a control panel from an on/off switch. They learnt the Mac years ago, and they love it because it doesn't get in the way of creativity. Many of these people have seen OS X, and said that if they have to buy new software, new machines, and learn a new operating system, then they may as well join the rest of the Wintel world, as things are cheap and easily available.

*Chris Wilder*

## Your Star Letter wins a copy of Office: 2001, worth £480

We reward the best reader letter with a copy of Microsoft's Office: 2001 for Mac. This integrated package of business applications includes enhanced versions of the market-leading Word, Excel and PowerPoint programs, as well as the new Entourage – a personal-information manager and email client.

Write to: Letters, Macworld, 99 Gray's Inn Road, London WC1X 8UT.

Or email [letters@macworld.co.uk](mailto:letters@macworld.co.uk). Please provide full name and contact details.

## Subject: Political alienation

An email I sent recently to the government's e-envoy ([info@e-envoy.gsi.gov.uk](mailto:info@e-envoy.gsi.gov.uk)) bounced back because of "transient non-fatal errors". This reinforces the fact that gateway.gov.uk has disenfranchised Linux, Mac and Unix OS users, as well as those not using Microsoft Internet Explorer.

Doesn't the e-envoy appreciate that there are other systems out there, and users' choice should be defended?

*Joseph Ortenzi*

## Subject: Multitasking for years

Forget Mac OS X's "modern" functionality, I've had a pre-emptive multitasking system (albeit without the memory protection) running under Mac OS within the Forth environment for nearly a decade. It runs fine on a Mac IISI, and under emulation on a G3 desktop.

A powerful modern processor is not essential for multitasking. If Apple chose to do so, it could modify its operating systems for 680x0 processors to include pre-emptive multitasking, and – for PowerPC processors – memory protection as well. Thus OS 9.1 could be used to run existing software in the multitasking environment of OS X, and without the speed loss reported in the Classic environment.

*Ian van Breda*

## Subject: Mac rude boys

Are PC users more polite than their Mac users? I was an avid Napster user, and whenever a Mac was downloading a file from me, not one user ever answered my messages. Conversely, PC or Unix users always answered. Nowadays, I expect the worst from Macintosh users.

*Simon Jennings*



## Star Letter: Clueless

During a recent visit to the Norwich branch of Comet, I couldn't help overhear a family conversation about buying a computer.

They were gathered around a G4 Cube. All three were impressed that the mouse could click without buttons, and then they began admiring the slimness and sleekness of the Studio Display. Then the mother asked: "But where's the computer?"

Father and daughter looked at each other, before the father said in an authoritative voice: "Clearly, they've placed it in a cupboard out of view." Then the daughter, pointing to the Cube, said: "But what's this box?" "That's the power adaptor," she was told by her father. Has Apple spent millions of dollars designing computers only for people to mistake them for power adaptors?

*Colin Cousins*



## Subject: Carbonized appence

I've got Mac OS X, but when are the applications I really need for it going to arrive? As the studio manager of a small advertising agency, I look to keep up to date with our software needs. This includes QuarkXPress, Microsoft Office, and Adobe Photoshop, Illustrator, Acrobat and ATM, among many others.

How can I go to my director asking for funds to update my present applications, when I'm sure to be making the same request when key apps finally ship to OS X? Do I just ignore OS X and its improved stability until all or most of the above are able to work fine on a Mac OS X network?

*Aaron Ireland*

## Subject: Moment of madness

Why is it that Macintosh users find it almost impossible to defect to Wintel machines? I'll tell you.

I've had a Mac Classic for eight years and also bought an original iMac in 1998. I recently purchased a JVC digital camcorder, only to find that the software for my Mac was for the old serial-port types, and I couldn't use it with the

camera. I had to exchange it for a more expensive JVC camera which had a USB port – but again, not all the software was available for Mac. So, what did I do? I went and bought a Sony Vaio! The DV software on it was excellent, but could I get used to using Windows 2000? You've guessed it. After two days, I was regretting not buying the titanium PowerBook. I'm getting rid of the Vaio, and returning temporarily to my good old iMac.

*Dr Nicholas Herodotou*

## Subject: Meaningless metric

I was interested to read Bill Kocher's views on metric vs imperial (July letters). I work in a design studio and use millimetres every day. I never think in metric, though, and realised this upon browsing *Macworld* itself, in which many advertisers state the dimensions of the new iBook in centimetres. Your advertisers should take note that, despite what those in authority want us to think, most of us continue to think in imperial, rather than the markerless wilderness of metric.

MW

*Michael Faith*



It's a big month, with 30-day trials of FreeHand 10 and FileMaker Pro 5.5, and a tryout of Adobe's After Effects 5. And there's a demo of SpaceTripper, plus the usual blend of demos, shareware & updaters. Vic Lennard explains all...

## MAIN ITEMS



### Macromedia FreeHand 10 30-day trial

FreeHand 10 offers unsurpassed productivity features and sophisticated vector-based illustration tools. New features include: true contour gradients, symbol-based brush and spray strokes, Macromedia standard pen tool and common user interface, smart cursors for automatic joins, editable symbol library, Flash Player test window, and master pages. You can even import files into Macromedia Flash 5.

Requires a Power Mac, with 40MB free RAM and Mac OS 8.6 or later. Runs in Mac OS X native mode.



### Adobe After Effects 5 Tryout

The standard version provides a core set of compositing, animation and effects tools. New features include the ability to composite layers in 2D/3D space (with fine control over multiple cameras and lights), hierarchical animation of layers and masking enhancements.

The tryout version is save- and export-disabled. Requires a Power Mac with 64MB free RAM and Mac OS 9.0.4 or later.

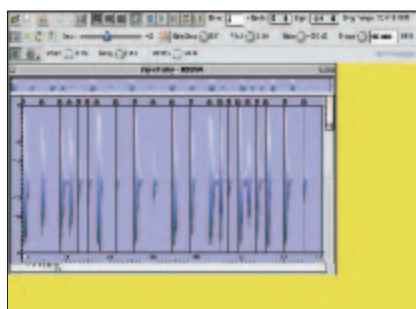


### SpaceTripper demo

SpaceTripper is a truly modern arcade shoot-'em-up, combining the manic gameplay of classics such as Defender, with a stunning state-of-the-art 3D engine. Everything you would expect is here: loads of enemies, big bosses, power-ups and a sore trigger finger!

Fly your spacecraft over enemy platforms, blast everything in your path and then progress to the next stage. Simple? Nope – this is one seriously tough blaster.

Try the three-level demo. Minimum requirements: 300MHz G3 with 64MB free RAM and Mac OS 9 or later with CarbonLib. Does not run native under Mac OS X.



### ReCycle 2.0 demo

ReCycle lets you do with sampled loops what you can do with beats programmed from drum sounds – such as alter tempo, or replace sounds, and process them individually. Version 2.0 is a complete rewrite with a new user interface. The demo is fully functional, but only with the four supplied loops. Requires a Power Mac with 16MB free RAM and Mac OS 8.0 or later.



### FileMaker Pro 5.5 trial

Create, share and manage information and projects. Take advantage of Instant Web Publishing capabilities that render database layouts on your intranet with just one click. Now supports native Mac OS X.

Trial version expires after 30 days, and is limited to 50 records. Check the Read Me for other restrictions.



# Cover CD

## AUGUST 2001

The CD-ROM on the cover of *Macworld* is supplied as is, subject to the following terms and conditions. The CD-ROM is provided as a free item to readers of *Macworld* for their personal use, and may not be resold or copied for distribution. The publisher shall have no liability without limitation for any losses or damage arising from using cover-CD software – or for taking advice from *Macworld*'s CD trouble-shooting point-of-contact – including any loss of profit, damage to equipment or data, interruption of business, or any other damage, direct or accidental. It is strongly recommended that you back-up any programs or data on your hard disk before installing any cover-CD software. If problems occur, it is most likely to be a result of an incompatibility or conflict with other software on your system. *Macworld* cannot be held responsible for discontinued offers. This does not affect your statutory rights.

### INSTALL



Before you start working your way through the software on our CD, go to the System Utilities folder and make sure you install the following:

#### ■ Acrobat Reader 5

Install this version to be able to read many of the on-screen manuals.

#### ■ Stuffit & RealPlayer

Version 6.0.1 of Stuffit Expander and DropStuff is included as is the installer for RealPlayer 8.

#### ■ System tools & ATM Lite

The CD also carries the latest version of InternetConfig, UnZip 5.32 and ATM Lite 4.6.1 (required for Suitcase 9).

#### ■ QuickTime 4.1.2

Some programs require QuickTime 4.1.2. This can be downloaded from [www.apple.com/quicktime/download](http://www.apple.com/quicktime/download).

## INSIDE MACWORLD



### Art Directors Toolkit 1.1

Packed with features, from viewing every possible character in a font to capturing the actual colour of a screen pixel and more. Thirty-launch trial.

### FontAgent 8.5

Optimize and organize your fonts. FontAgent 8.5's comprehensive features give you complete control over your fonts. Demo only tests for problems.

### iView MediaPro 1.0.5

View, organize and present your growing number of photos, images, movies, sounds, fonts and other media files. Fourteen-day trial.

### MS Office 2001 SR1

Service Release that addresses a number of problems including those concerning saving files in formats other than Word 98-2001.

### PocketDock 2.11

Utility to organize and launch applications, documents, web links and email addresses. Essentially a Mac OS X equivalent to the OS 9 Launcher. Shareware.

### plus...

DO\$H Cashbook trial. Eradicator 1.6. Ghost Hunter 2.0.1. Hot Door Perspective demo. Sapphire PS6 demos.



### Cinema 4D XL 7.0

Filled with many high-end features and special effects. Save-disabled demo includes samples.

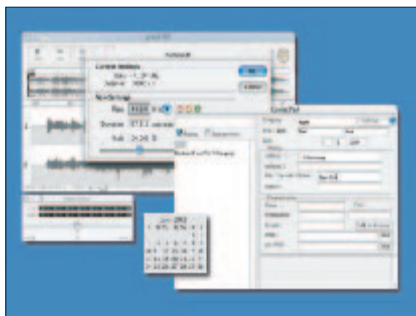
## CD CATALOGUE



Courtesy of Mark Pirri's superb DiskTracker program, Macworld brings you a searchable catalogue of all our CDs from 1997 to 2001 – almost 224,000 files! This will grow month by month to allow you to find any file you want, without wearing out your CD-ROM drive. The latest version of DiskTracker (2.1.1) is also included – don't forget to register if you find our library useful.



## OS X HEAVEN

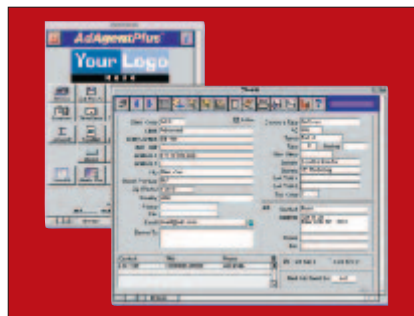


OS X Heaven – your monthly one-stop shop for the latest OS X-specific software. Utilities, demos, shareware and games – OS X Heaven features the best Carbonized goodies for the Mac's new OS.

This month there's 21 shareware utilities including **Sound Studio** 1.5.5, an audio recording and editing tool; **iOrganize** 3.4, an advanced note pad, address book and alias manager; and **AquaCal**, a simple graphical calendar. We've also included three other useful music programs: **ID3X** 1.52, **Amadeus II** 3.2.1 and **AudioCD Dockling** 1.20.

There are also three Carbonized games including **CrossCards** 2.0, a neat combination of poker and crosswords, and **Colibricks**, a classic arcade paddler.

## SERIOUS SOFTWARE



### AdAgentPlus 3.90 trial

How you manage your time is critical to your success.

AdAgentPlus is a great tool for advertising agencies to help maximize productivity. The system performs many tasks including job tracking, costing, estimating and purchase order entry. Single or multi-user network versions are available. AdAgentPlus is cross-platform, allowing you to use both Mac and Windows on the same network. AdAgentPlus, which includes double-entry accounting, is the agency management system built by advertising professionals.

The 30-day trial has limitations: check the 'ReadMe.html' for a list of these.



### MacDraft 5.0 demo

MacDraft emulates a drafting board while giving you the advantages of creating and working with scaled images on a computer; you can easily make changes without physically erasing or discarding sheets of paper. Its greatest strength as a drafting and design tool is the way it enables you to define your drawing environment. Using simple commands and palette choices you can specify the default scale, drawing units and page setup for the drawing. The scaled environment automatically keeps track of the size and area of the objects you draw.

The demo is fully functional but save and export disabled.





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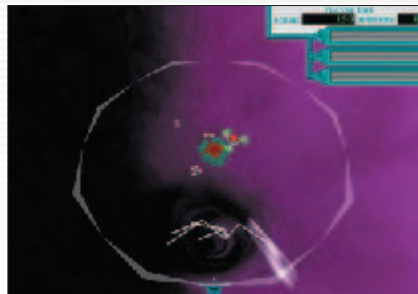
## AUGUST 2001

### FAULTY COVER CD-ROM?

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 • If your cover CD doesn't seem to work as it should, please check you have read all the instructions on the cover disc pages carefully first. If it still doesn't work, then please email Woody Phillips at [woody@macworld.co.uk](mailto:woody@macworld.co.uk).



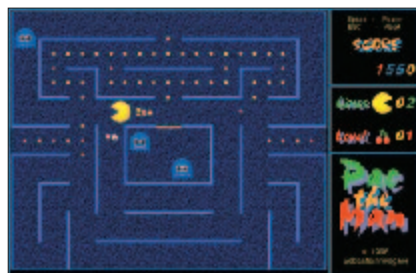
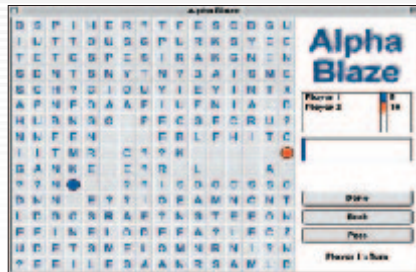
## GAMES WORLD



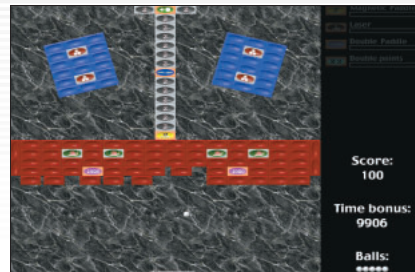
### Vortex NG 1.03

Vortex Next Generation is the latest thrill ride for lovers of the breakout genre of games. Probably best described as a cross between Arkanoid and Tempest, Vortex NG breaks the 'paddle and walls' barrier by allowing the paddle to rotate 360° around the 'blocks.' Along with a slew of other features, it also supports both local and networked co-operative multiplay – something sorely lacking in other breakout-styled games. With stunning special effects and numerous alien types, power-ups and blockade types, Vortex NG will addict you instantly.

This six-level demo requires a G3 or better with 14MB free RAM, and runs in Classic mode: check the Read Me for more.



## DEMOS & GAMES



This month, Macworld's Top 10 Shareware Games folder is split evenly between arcade and strategy games.

On the arcade side, there are the latest versions of **Bub & Bob**, **Colibricks**, Macyunsoft's **Snake**, and **Pac the Man**. In addition, there's a nice-&-easy one-arm bandit game courtesy of **IvanSlots**.

For those of you who like puzzles, we've included **CrossCards 2.0**, an odd combination of poker and a crossword puzzle, **Enigma 2.0**, **Alpha Blaze**, an enjoyable reverse Scrabble-style word game, and the latest version of **Zador**. You'll also find **NetFungus 1.0.2**, which can be best described as Othello with Tetris pieces.

(Top row) **Alpha Blaze** & **Colibricks**  
 (Middle) **Pac the Man**  
 (Bottom) **Zador**

## ALSO ON THE CD



### COMMS & INTERNET

12 applications including:  
**BeMailer 4.0.2**  
**DupliMizer 2.2**  
**HTML-Optimizer 5.2**  
**NotifyMail 4.0.4**

### FONTS

Three items including:



**FontDoctor 4.52** (demo)  
**Mini FV 1.1.1**

### GRAPHICS

Seven items including:



**Etchelon Macdoodle 2.2.2**  
**RainbowPainter 2.0.1**  
**Screen Catcher 2.3.4**

### ICON UTILITIES

**IconBuilder Pro 2.1**  
**IconizerPro 1.4.5**

### INFO



**ATPM 7.06**  
**Extension Overload 5.8.4**  
**Mac Scripter's Mag #5**  
 plus six utilities for developers

### MATHS & SCIENCE

Seven items including:  
**earthbrowser 1.5.1**  
**MoonMenu 1.7.1**  
**TopCalulette Pro 3.0**

### SCREENSAVERS

**iScreensaver 1.6**  
**Setting Sun 1.6.1**

### SOUND & MUSIC

Five programs including:

**Amadeus II 3.2.1**  
**ChordBook 2.4**  
**Virtual Composer 2.8.5**

### UTILITIES

Seven categories with over 35 useful tools for your Mac including:

**BTV Pro 5.0**  
**Convert 1.2.8**  
**Doublet Scan 3.3.2**  
**Drop Drawers 1.5.5**  
**KeyStrokes 2.1.1**  
**Label Printer Pro 6.0.1**  
**Mt. Everything 1.5.4**  
**Pretty Scroll 2.0.1**  
**Scheduler 2.1.2**  
**SimpleEnvelope 1.6**  
**Tex-Edit Plus 4.1.2**  
**TexFinder 1.7**



**TextSpresso 1.8.2**  
**Thermograph 1.3.2**  
**txt2pdf 5.0**  
**VideoScope 1.3**  
**Wapp pro 3.2.1**  
**Windolene 1.1.2**

### UPDATERS

This month's dedicated updaters folder includes over 45MB of patches to bring many popular applications bang up-to-date, including:  
**Adaptec 2906 Driver**  
**Cadmover 5.5**  
**ContentBarrier 1.2.1**  
**iMic Control 1.2**  
**LaCie Updater 6.4.2**  
**MS Word 98 Security Upd.**  
**Norton AntiVirus 5-7 (06/01)**  
**Norton AntiVirus OS X Upd.**  
**Personal Firewall OS X Upd.**  
**Rewind 1.2**  
**Virex (06/01)**  
**VirusBarrier (06/01)**  
**VirusBarrier Updater 1.6.1**  
**Web Server 4D 3.5.3**  
**Word 2001 Security Upd.**

## DON'T MISS...

### ■ Cool Extras

Seven sets of icons  
 Over 180 Mac OS X icons courtesy of iconfactory.

### Invisible Finder

Manage invisible files and folders – delete unused items and save hard disk space.

### ■ Mac ISPs

Internet access offers from AppleOnline & LineOne.

### ■ Netscape/Internet Explorer

Complete packages for Netscape 6 (with 6.01 update) and IE 5.

### ■ Plus...

... many thanks to Simon Youngjohns for our CD icons.



## SHAREWARE



Shareware is a distribution method, not a type of software. It makes fitting your needs easier, as you can try before you buy. Shareware has the ultimate money-back guarantee – if you don't use the product, you don't pay for it. If you try a Shareware program and continue using it, you are expected to register. Support shareware authors so that they continue to provide high-quality programs for the Mac.



# Cut QuickTime free, demand developers

## History of QuickTime

**1987** Steve Perlman from Apple's Advanced Technology Group develops hardware-based QuickScan video technology that gives Mac capability to run three-dimensional video clips. Apple never launches it.

**1988** Apple CEO John Sculley predicts a multimedia revolution.

**1990** Apple engineer Bruce Leak dreams-up completely software-based multimedia technology. Project 'Warhol' begins.

**1991** Sculley announces that QuickTime will ship in one year.

**1991** Leak demos QuickTime at WWDC in May – overshadowing launch of Mac System 7.

**1992** Apple ships QuickTime software, based on QuickScan hardware, giving Macs the multimedia capability to incorporate moving video, sound and text. The most famous early QuickTime clip was of a rocket blast-off. Later in the year, Apple ships QuickTime for Windows.

**1993** Sculley proposes to split Apple into two pieces: hardware (Macs, printers, etc) and software (Mac OS, QuickTime, etc). Apple releases QuickTime 2.0, adding support for music (MIDI). QuickTime VR ships. In December, Apple files suit alleging infringement of QuickTime in Microsoft and Intel's Video for Windows code.

**1997** QuickTime VR 2.0 ships.

**1998** Apple releases QuickTime 3.0, improving the interface, and adding low bit-rate codecs, such as Sorenson, and QDesign Music.

**1999** QuickTime 4.0 released, featuring a completely new metallic-style interface. Apple also releases the pay-for QuickTime Pro, with extra editing features.

**2000** QuickTime 5 Public Preview released, with Aqua touches – later removed for OS 9.

**2001** April: QuickTime 5 ships.

QuickTime developers deserve an answer from Apple's senior management as to why QuickTime is "faltering" and losing market share, according to Randall McCallum, former chairman, CEO and president of Totally Hip Software, and self-professed "former outspoken QuickTime developer who still believes in QuickTime".

His solution? QuickTime Inc., a separate subsidiary of Apple.

"QuickTime will enjoy superior customer-satisfaction ratings across operating systems, and take its rightful place as the streaming-media technology of choice only when and if QuickTime ever satisfies the most major concern for enterprises large and small," McCallum said.

Most QuickTime developers and even senior-management people within Apple have always known the truth, but they are afraid to admit that QuickTime's perceived dependence on Apple is the real problem, he added. QuickTime lags in third place behind RealNetworks and Microsoft's Windows Media Player solutions solely because it's widely viewed by IT professionals, developers, and analysts as an Apple-centric technology, McCallum said.

"It has nothing to do with QuickTime being the most comprehensive and robust streaming-media technology solution," he claimed. "QuickTime will never gain the mind-share necessary to become technology leader if it continues to be under Apple's parenthood."

Most Windows IT managers won't use Apple-centric technology – even a "best solution" like QuickTime – because they worry what would happen if Apple went out of business, McCallum said.

Some people in the computer industry see QuickTime as "lagging" behind RealNetworks' products and Windows Media Player. Others have wondered about the multimedia technology's future since RealNetworks doesn't intend to jump aboard the MPEG-4 ship, and Microsoft is already distributing



non-ISO MPEG-4 codecs. MPEG-4 is based on QuickTime.

McCallum opined that RealNetworks is the front-runner because it's independent of Microsoft and Apple, makes its own rules and creates its own technology. It's free to plot its own strategies, unrestricted by a platform – and this gives RealNetworks the most flexibility.

### Unencumbered progress

"The majority of consumers adopt the leader because it represents the least perceived risk. Their sole focus is RealPlayer. They don't worry about hardware sales and focus on the customer. They dominate by progressing forward unencumbered."

"Apple's senior management has to make a major business decision and bite the QuickTime bullet," McCallum said. "The baby has grown up and needs to fend for itself. It is time that Apple spins the QuickTime Group out into a separate, completely autonomous business unit before it is too late. This will allow QuickTime Inc. to compete with RealNetworks and Microsoft on a level playing field."

Apple is too focused on Mac OS X to give QuickTime the marketing strategy, he added. A separate

QuickTime Inc. would be able to operate much like FileMaker Inc. and RealNetworks, where it can continue to add value by preserving its characteristic superior technology and ease-of-use, even as it integrates new technologies, supports emerging industry standards and addresses the changing needs of markets, he said.

"Apple senior management would again find itself with another profitable independent business unit," McCallum said.

"No longer would QuickTime be perceived as an Apple-only technology. It would be seen as the best technology for delivering value added rich streaming-media solutions to millions of customers worldwide."

Phil Schiller, Apple's vice president of Worldwide Product Marketing, doesn't feel that QuickTime is losing ground to competing RealNetworks and Windows technologies.

"Certainly, Microsoft and others are doing a lot of good things, as are we, but I think that we're at the beginning stages of the industry," he said.

"So far, many companies have lost more money in streaming media than

made money doing it. So, to say anybody is winning or losing is silly, because the market hasn't been created yet."

Schiller also thinks that the perception that QT is falling behind overlooks several important developments. Being selected as the format for MPEG-4 is a huge advantage for Apple that will have "hundreds and hundreds" of companies supporting QuickTime, he said. There are 20,000 applications that work with QuickTime and no other product has that kind of support, he said. And there are "hundreds of millions" of QuickTime players out there, which shows that the technology has strong support from end users, he added.

### Under the skin

However, he does admit that Apple has a perception issue to overcome, which is one of the reasons the company attended June's Streaming Media West Conference in Long Beach, California. It gave Apple the chance to tell where QuickTime is, what it is, how great it is, and the reality of how well it's been adopted and supported, Schiller said.

"We're showing some of the great things that are being done with it that no one else is doing, like the user-interface 'skins' (see below), and things we've been doing with digital cameras, and other new places that no one else has," he added.

Most of the spotlight shining on Apple focuses on Mac OS X. That's just fine with Schiller, who said that it's a great platform for QuickTime. In fact, he said it's the "best platform".

"We've integrated QuickTime right at the core system level, in a way that I don't think people have seen before," Schiller said. "It means that you can utilize QuickTime content throughout the system. QuickTime will perform better throughout the system because of the core architecture, and great new faster networking."

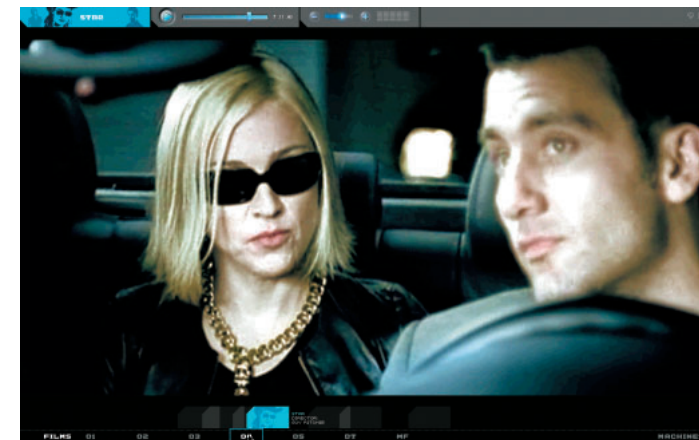
"There's more support for industry-standard formats (over 60) in QuickTime than any other architecture technology available," claimed Schiller.

He pointed out that QuickTime now includes "native support for Adobe Photoshop. QuickTime actually retains the layer information." At the conference, he showed "all the other amazing effects, things that aren't included in other architectures for colour-management effects, so you can create some of the most pristine, beautiful and interesting content inside QuickTime."

Talking of QuickTime TV, and the QT Movie Trailer Channel, Schiller said: "It's now the number-one movie-trailer site on the Web."

The Apple execs didn't have much opinion on McCallum's idea that Apple spin-off QuickTime into its own subsidiary, similar to FileMaker. Frank Casanova, director of QuickTime product marketing, merely said: "Everyone's entitled to his opinion."

"QuickTime is a core component of the Mac," Schiller said. "It's critical to our strategy of the digital hub. And so QuickTime is incredibly valuable to us for what it brings to the Mac, and we would never want to be separate from that if we didn't have to." **MW Dennis Sellers and Andrew Shalat**



### Getting QuickTime off the borderline

Schiller cited *BMWfilms.com* as a prime example of how QuickTime is being handled by other companies on the Web. There are several short movies available for download at [www.bmwfilms.com](http://www.bmwfilms.com). One stars Madonna, and is directed by her husband, Guy Ritchie. The *BMWfilm* stand-alone player is actually a QuickTime player with a "Media Skin" unique to BMW. "The player becomes the brand – emphasizing content, not provider," explained Schiller.



## Expo crowds await new Apple products

Macworld Expo takes place in New York, July 18-20. Apple maintains a high-security attitude to product-announcement secrecy, so the fastest way to learn of any new Macs unveiled is to visit [www.macworld.co.uk](http://www.macworld.co.uk) on July 19 (or the previous evening if you really can't wait!).

While nothing is guaranteed, Apple is widely expected to show-off a bold new iteration of its phenomenally successful iMac computer – possibly with a flat-panel LCD screen in place of its present built-in 15-inch CRT display. There could also be updates to Apple's software products, such as iMovie and iTunes. Another free application – possibly called iPicture – is rumoured to tackle still digital images in the way iMovie handles digital video and iTunes organizes digital music.

Aside from these rumoured introductions, Apple is sure to be pushing its next-generation operating system, Mac OS X, at every opportunity.

A day after Apple's CEO Steve Jobs announces new products at his Expo-opening keynote, Kevin Browne, general manager of Microsoft's Macintosh Business Unit, will discuss how Office 10 for Mac OS X will take Macintosh productivity "to the next level".

More than 60,000 Mac enthusiasts are expected to attend the Expo, with the conference program showing a 25 per cent increase over last summer's event. Exhibitors include Apple, Epson, FileMaker, IBM, MacSoft, Matrox, Media 100, Microsoft and HP. **MW**



### Cube 'to be canned'

Apple seems certain to kill-off its Power Mac G4 Cube product line at Macworld Expo, replacing it with a new-look iMac boasting a flat-panel screen.

It is believed that Apple sold less than 250,000 Cubes, despite it winning a clutch of design awards.

Apple CEO Steve Jobs described the Cube as "the most beautiful product we've ever produced" at its launch last July. But it was deemed by many as too expensive, as its looks demanded a costly Apple LCD screen.





# Java developers rush to Mac

## What is Java?

The Java platform is a fundamentally new way of computing, based on the power of networks and the idea that the same software should run on many different kinds of computers, gadgets, and other devices. Java technology components don't care what kind of computer, phone, TV, or OS they run on – as long as it supports the Java platform.

Programs written in the Java programming language run on many different kinds of systems thanks to the Java virtual machine – a translator that turns Java platform instructions into tailored commands that make devices do their work.

With Java technology, the Net and private networks become your computing environment – with portable, modular, and secure software.

Java technology eliminates many of the problems associated with installing and running applications because, generally, the Java user does not have to configure, load, or install anything. Instead, computing devices tap into the network and funnel its power to the user. Upgrades are automatic, making installation and configuration obsolete.

June's JavaOne conference in San Francisco saw Apple take a major presence, reflecting its improved implementation of Java. Apple CEO Steve Jobs appeared at JavaOne last year, vowing to make the Mac the "best Java delivery vehicle on the planet", and promising major improvements in Java compliance in Mac OS X. Apple's new operating system offers support for the Java 2 programming language.

The company took a booth at the front and centre of the JavaOne show floor, attracting steady interest during the event.

"We've been getting a lot of traffic from our booth placement," said Apple Java Technology manager Alan Samuel.

Rather than relying on Mac Runtime for Java (MRJ), as previous versions of the Mac OS did, OS X sports full compatibility with Java 2 Standard Edition version 1.3 (J2SE 1.3). For that reason, Samuel says, the Mac has suddenly become a much more attractive solution for Java developers.

## Java erupts

Mac OS X's full J2SE 1.3 compatibility means that Java applications will run more reliably on the Mac than ever before. More important, OS X will work better as a development environment for those who want to write Java applications.

"The thing is not to get existing Macintosh users, because they already know about it. It's to show everyone else," Samuel says. "When I show people the new operating



system I say, 'OK, give me your 'jars,' (a Jar is a Java application) and then I just take them, run them on OS X and show them how simple it is. You can compile for Solaris, or whatever, and it will work."

Other Mac-oriented companies also made their presence felt at JavaOne.

Zero G Software ([www.zerog.com](http://www.zerog.com)), whose founder and CEO Eric Shapiro appeared at one of the Apple Worldwide Developer Conference keynotes in May, demonstrated its Java-based InstallAnywhere and PowerUpdate software on a couple of 733MHz Power Mac G4s running Mac OS X.

InstallAnywhere (Standard Edition, US\$995) allows users to write Java-based Aqua installation programs in OS X that will work on any platform.

PowerUpdate (pricing on a per-site basis) allows users to create Java-based automatic software updates. Both should ship this summer.

## Java erupts

Meanwhile, Borland was showing off its own under-development Java solution, JBuilder for Mac OS X, which debuted at WWDC.

JBuilder is a visual development environment for creating Java 2 Standard Edition (J2SE) applications that take advantage of the Aqua user interface.

With its robust implementation of the standard, and increased interest in the Mac as a developmental platform (especially with Mac OS X), Apple is likely to increase its presence in the Java community. **MW**

Mathew Honan

# IBM stretches for speed

IBM has developed a new process that promises to boost chip speeds by up to 35 per cent – by stretching the silicon, the material at the heart of microchips.

Dubbed "strained silicon", the technology stretches the material, allowing electrons to move faster through the chip's transistors, increasing performance. The technique also gives the option of trading-off performance against savings of about a third in power

consumption, IBM said.

The company (which alongside Motorola develops the PowerPC chips used in Macs) expects the technique to be commercially available by 2003. IBM spokesman Rupert Deighton, said: "Electrons are the ones and zeros running through the chip and they can flow up to 70 per cent faster in stretched silicon, resulting in 35 per cent faster performance, and an equivalent reduction in power

consumption for a chip made using this material."

"Reducing the actual size of the transistors on a chip requires refined and redefined lithography. One plant costs billions of dollars. With this new process, we don't have to shrink to get incremental performance," said Deighton.

Stretching silicon is not an IBM invention, Deighton acknowledged. "We took the theoretical concept, put it into practice, and can

now take it into cost-effective production," he said. **MW**  
Joris Evers



LCD (liquid crystal displays) screen prices are continuing to fall, as manufacturers vie for market share – but industry watchers are predicting that prices have bottomed out – and may even increase in the near future.

Half of the TFT (thin film transistor) displays featured in July Macworld's comparative flat-panel round-up have already had their prices cut significantly.

In June 2000, market analysts IDC revealed that the worldwide LCD market had grown by 46 per cent since 1999. In April this year, analyst DisplaySearch stated that 6.6 million LCD displays shipped in 2000 – and predicted 12 million sales in 2001. IT industry pundits widely predict sales of around 24 million LCD monitors in 2004.

Apple is following LCD market trends – recently introducing the 17-inch Studio Display (pictured right, bottom) for £699, and cutting the price of its 22-inch Cinema Display by £1,000 to £1,799, and its 15-inch Studio Display by £250 to £449.

Of the LCD manufacturers, Sharp initiated the latest round of price cuts, by slashing its 18.1-inch LL-T1810SA down from £1,899 to £1,329. LaCie made the second biggest cut – making its 18-inch Photon18Blue £1,199, a £300 saving. Samsung then shaved £290 from the cost of its 15-inch SM150MB (pictured below), making it £590.

MaxData's product marketing manager, Noel Dunne said: "The price of LCDs has dropped significantly over the past six months. Panel components have become cheaper, so we can sell them cheaper."

Dunne added: "LCDs have gone from being a corporate to an end-user product. We think the largest price drops have already occurred, and that others that follow will be smaller."

Allan McDonald, Samsung's product marketing manager, said: "The industry thought consumers would move away from conventional CRTs and start buying 15-inch TFTs. This hasn't happened and there has been a subsequent oversupply out-stripping demand. Everyone got their fingers burnt."

However, not everyone has cut prices. The £515 Iiyama TXA3834MT stays put, as does ViewSonic's 15-inch



# LCD price war 'flattening out'

VP150mm, ELO's 15-inch touch-screen, and NEC's 18.1-inch MultiSync 1850DX – priced at £515, £809 and £1,649 respectively. Iiyama is planning to reduce its 15- and 17-inch TFT monitor prices across the range in July, revealed marketing supervisor Kerry Lee.

## High-end misses out

George Leptos, UK General Manager for LaCie, said: "We target mainly professionals and graphic designers interested in high-specification TFT monitors, so are not affected by the price war."

A shortage of LCD components last year is the root of today's price fluctuations, according to Bryan

Norris, senior partner of Bryan Norris Associates.

He claims that a lack of LCD panels for monitors in 2000 attracted Taiwan-based flat-panel producers, who then oversupplied the market.

He said: "In 2000 there was a shortage of

larger LCD panels suitable for computer displays. The panel constitutes around 75 per cent of the monitor's cost.

"Towards the end of the year, a number of producers in Taiwan came on-stream with their panel products, and panels went into an over-supply situation.

"In order to stimulate demand and recoup some money, panel prices plummeted from the Taiwan producers – and also from Korean manufacturers trying to maintain their market share. LCD prices are now as low as they are going to go, and increases may occur."

Iiyama's Kerry Lee doesn't rule out a price hike, either: "Last year there was a glut of LCDs that had to be sold as quickly as possible. Now this inventory has been cleared, prices will have to be re-aligned with manufacturing and market demands.

"I expect prices to go up again, but by no more than ten per cent."

**MW**  
Dominique Fidèle



## All change for Apple software downloads

Apple's Software Downloads pages have been assimilated into the company's Knowledge Base online support area – click on the support tab at [www.apple.com/uk](http://www.apple.com/uk). Previously, downloads could be found at [www.info.apple.com/support/downloads](http://www.info.apple.com/support/downloads).

The Knowledge Base pages contain only the most current Apple software updates. Earlier versions of Mac OS software and hardware must be found by browsing the Downloads Web site. The page lists a number of the most recent updates, with links to take users to the relevant section of Apple's site. Knowledge Base requires registration and a password, though Apple also suggests users utilize the automated software update features built-in to Mac OS 9.x and OS X.





# Online in line of Adobe vision

## Palm turns to Bluetooth tech

Palm Inc has announced a solution that will connect Palm customers with wireless networks using the Bluetooth short-range wireless standard.

The postage stamp-sized Palm Bluetooth Card has a range of 10 metres between Palms and other Bluetooth-enabled devices, including mobile phones, laptops and printers. It was co-developed by Palm and Toshiba, and is compatible with the new-generation of Palms, equipped with Secure Digital (SD) multimedia expansion-slots. Palm promises to ship the product before the end of the year for \$150.

Bluetooth is an emerging standard supported by major vendors including IBM, Ericsson, Nokia and Toshiba. It's designed to allow devices to communicate over short distances.

Palm's senior director of product marketing, John Cook, said: "Bluetooth can change the way we work, share information and interact with each other."

The emerging standard is becoming a major issue for future tech companies such as Palm, Adobe and Macromedia. It also supports Personal Area Networking (PAN), meaning that multiple Bluetooth devices can form a PAN, with up to eight devices communicating and sharing information. Palm plans to release support updates for Palm OS 4.x, which will enable Bluetooth-based software applications to work on Palm OS handhelds.

Cook said, "In a few years, people will use their handheld to talk to a small Bluetooth server hub at, say, a local coffee shop, and be able to check their email."

Network publishing is shaping Adobe's vision of the future, and the company's senior vice president of Web publishing, Bryan Lamkin, is the man charged with making this vision a reality.

"It's not just about making products that can export to the Web, it's also about delivering products that can publish to different platforms simultaneously," Lamkin told Macworld in an exclusive interview. The shift from conventional paper-printing to Web publishing is increasing, with the appearance of an abundance of devices ready to accept dynamic content.

"It's hard to anticipate everything that will come up, but future generations of products will explore the diverse possibilities of publishing," predicts Lamkin.

He believes that "Apple will continue to be a key element in the publishing world," adding that "we're banking on it, and are integrating OS X into all our major application development," he revealed.

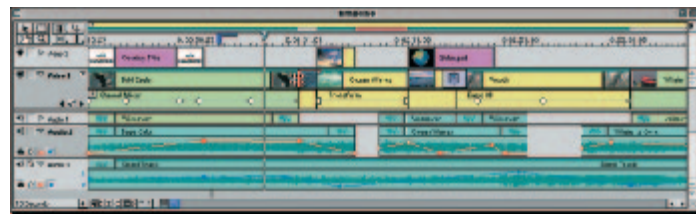
The tall, good-natured Lamkin has been at the heart of innovation in Silicon Valley for 15 years. He began his career at the Software Publishing Corporation, where he spent six years developing and marketing the Harvard Graphics product line. He gained his degree at the fashionable and influential University of California, at Berkeley.

"I joined Adobe in 1992 to help the company bring its products to Windows," he said. "Its products had



**Futures market**

Adobe has already released a windows version of Atmosphere (above) – its 3D Web application – but remains tight-lipped over an OS X version. The company is also eyeing 300 million computer owners worldwide – only a tiny number of whom run the full version of Acrobat (right).



**Curtain call**

Adobe has demonstrated a Carbonized version of Premiere – its video-editing application – but has yet to commit to a release date.

been strictly for the Mac before then, and I had a Windows background. I had to develop an understanding of the graphics space. Now I'm the VP of Web publishing – covering everything we ever put out for the Web, including Photoshop 6.0 and Illustrator."

He grinned: "That's what I do. That's what keeps me up at night and keeps me busy during the day."

Lamkin tried to placate the many Macintosh users who bemoan Adobe's tardiness in bringing its applications to Apple's next-generation operating system.

### Apple 'a strong partner'

"Apple is a strong partner for Adobe," Lamkin insists. "We collaborate very closely, and are both interested in making sure we develop the platform for our customers."

However, Lamkin refused to reveal Adobe's schedule for bringing its applications – particularly Photoshop – to OS X, saying: "We can't reveal this because of competitive reasons."

Mac-savvy designers itching to

enjoy OS X's system-level strengths will be interested that Lamkin said: "What we can say is if you look back, you'll see that our product upgrade-cycle is around once every 12-18 months." But he went on to warn that "for our more complex products we err on the longer side".

Photoshop 6.0 shipped in October 2000, meaning designers may have to wait till spring next year for a Carbonized Photoshop.

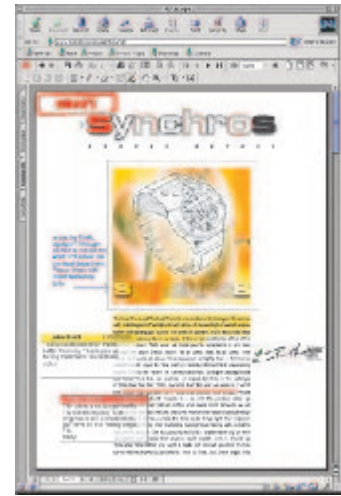
Lamkin confirmed that the next major update of Photoshop would be a Carbon, rather than Cocoa, release. A Cocoa application is one written from scratch for Mac OS X, while a Carbon app uses existing OS 9 code rewritten with Carbon APIs (Application Programming Interfaces). Carbonized applications will run on both Mac OS 9.1 and OS X. Programs built in Cocoa will run on OS X alone.

"It makes more sense for us to release it as a Carbon rather than Cocoa application, so we reach a broader base of users," Lamkin revealed.

He also praised Apple's commitment to its Unix-based operating system: "As far as we are concerned, OS X is the future of the Macintosh. It offers everything for the Mac and we think it makes the Macintosh a compelling proposition."

### Quantum leap

OS X could spark a quantum leap for the platform, Lamkin believes. "We deal with other operating systems and in the past have had to hold back on some of the things that we could have delivered to other operating systems because Mac OS would not support them. Apple has made a very strong statement with OS X, and we believe it will take the company forward.



Lamkin explained: "But before we hit the release schedule we need the market to be stable and the OS to be finalized."

Adobe's engineers are feeling the benefits of X, and Lamkin took pains to play down any developmental hurdles being experienced. "Any issues we have encountered have been based largely around areas that just aren't complete yet."

Adobe and Apple will work the problems out, he promised, adding: "Operating systems are complex things. They are big business, and take huge development efforts. Apple is to be commended for the effort it has already made."

### Atmosphere

Adobe is currently working on a new product called Adobe Atmosphere, which has been designed to "transform the Web into a universe of virtual 3D worlds". A Windows-only beta Builder and Player are already available. Will Atmosphere be Mac OS X-compliant upon its release? "I can't comment at this point," laughed Lamkin.

He added: "From a playback standpoint, we will support a broad range of platforms. From an authoring perspective, we haven't yet finalized which platforms we will support."

### Network publishing vision

"Network publishing is really a natural progression," Lamkin said. "In the 80s, the whole experience was constrained by the desktop parameter. Today, the first generation of 90 million Web-enabled mobile phones are just kicking in. Our vision



is about when it will become a substantial trend that will shift the balance, like in Japan. There, there are more wireless phones than PCs accessing the Web for content.

"The point of Network Publishing is to deliver information to these emerging sectors and devices."

Lamkin added: "The bubble may have burst for the dot-coms, but the number of Web pages, and the amount of rich content being published online is still booming, and that drives the need for tools."

"There are other trends that drive us," says Lamkin. "Digital-content acquisition regarding the massive increase in ownership of digital and

digital video cameras; the explosion in imaging; the emergence of increasingly rich, immersive Web content; and the appearance and acceptance of wireless devices that can access all this information, enabling collaboration."

Lamkin's enthusiasm for his subject is surpassed only by his determination: "We can't prepare enough for the next decade," he stressed.

"Adobe is in this for the long run. Yeah, we're obviously suffering in the current market, but these emerging trends offer great opportunities for Adobe."

**Jonny Evans**

## Adobe's economy drive Expo snub

Adobe won't be making an exhibition of itself at this year's Macworld Expo, New York, citing "economic reasons" for its drastically scaled-down presence at the show. Ironically, Adobe's latest slogan is "everywhere you look".

The company traditionally has a major presence at the event, but this year it is merely sponsoring the breakfast for the Mac User Group Leaders and the Mac User Group Newsletter Design Contest.

Sue Scheen, UK managing director of Adobe, said: "Adobe will

not be exhibiting at Macworld NY. This is not due to any change in strategy, but merely a matter of return in investment from attending such a trade show. Adobe's decision not to attend Macworld Expo New York in no way affects the company's strong support for the direction Apple is taking with OS X. Adobe reiterates its commitment to making its flagship products native to OS X."

Macworld has learned that exorbitant fees charged by union staff are responsible for a number

of companies pulling out.

The news is a shock for the Mac community, who have grown used to Adobe's presence at Expos since their inception.

Adobe's absence will upset Mac supporters who are already critical of the company's slow delivery of Mac OS X applications. Acrobat Reader, released in April this year, is Adobe's sole Carbonized application. An OS X version of Photoshop isn't expected until December 2001 at the earliest. Despite spiralling costs,

Macworld New York, held from July 17 to 21 at the Jacob K Javits Convention Center, promises to draw record crowds. Pre-registration is up 14 per cent compared to 2000. IDG World Expo, vice president, Rob Scheschareg said: "While other shows struggle with dwindling attendances, this is the must-attend event for Mac fans and those considering Mac products and services for the first time."

**Jim Dalrymple, Peter Cohen and Dominique Fidèle.**



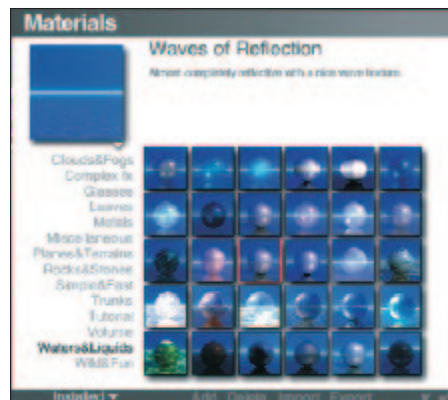


#### Material witness

Bryce 5 includes more Materials presets, to create everything from rocks, trees, and mountains to skies and buildings. The presets allow the user to create fantasy or fantastic ultra-lifelike worlds.

#### Special branch

A smart new feature in Bryce 5 is Tree Lab, which allows the user to create trees at will, by editing leaf and trunk texture, size and colour, as well as branch and twig distribution.



# Bryce 5's fantastic X images



## On the CD

■ Try out a demo version of the OS X version of FileMaker 5.5, the popular databasing application. The full version costs £219. More details on the product are available in Product News, on page 39.

■ PocketDock 2.1 is an easy-to-use \$20 launcher utility for Mac OS X. It organizes and launches applications, documents, Web links and email addresses. It supports drag-&-drop, and offers customizable views and skins. It supports most OS X-compatible browsers. [www.pocketsw.com](http://www.pocketsw.com)

■ Amadeus II 3.2 for OS X is available. This \$25 shareware manipulates, creates and analyses sounds, and supports MP3 files. It is available from [www.unige.ch/math/folks/hairet/martin/Amad2.html](http://www.unige.ch/math/folks/hairet/martin/Amad2.html)

■ FreeVerse Software has released a Mac OS X-compatible logic game, Enigma. It offers 100 levels and costs \$100. [www.freeverse.com/enigma/index.html](http://www.freeverse.com/enigma/index.html)

Corel has released Bryce 5, the Carbonized version of its 3D-graphics editor – with the company praising Mac OS X for making the version the fastest and most stable ever written for a Mac.

Greg Woods, communications manager of Corel UK, said: "Because of Bryce 5's unique user interface, it retains the same look-&-feel across all of the platforms on which it operates. But since Bryce 5 is optimized for OS X the key advantages for it are speed and stability. Bryce will run faster on OS X than, say, in Classic, or in some prior versions of Mac OS. By leveraging OS X, we can offer customers protected-memory architecture, power, stability and performance."

One of Bryce 5's most impressive new features is Network Rendering. This distributes renderings of a single image over an unlimited number of TCP/IP-based computers connected via an ethernet hub.

Multi-threading support is also new. This speeds-up image rendering and animation with no image-quality loss. Another new feature is Nano-Preview. This instantly displays animation effects that can be viewed



frame-by-frame in a Storyboard preview format. Individual frames can be selected and rendered, and changes can be made to frames within the animation sequence.

Two new effects labs create landscapes. Tree Lab creates and edits trees to suit a landscape, while Light Lab edits light effects. New controls include Intensity, Edge Softness, Falloff and Gradient Display.

Sky Lab – a Bryce 4 feature of that controls sky effects – has been beefed-up. The Starfield control – which peppers the sky with stars – has been enhanced for Bryce 5. Landscapes can now be created with interstellar patterns as they would appear from earth. Other new features include Metaball, a technology that creates organic shapes by reproducing the interactions of magnetized spheres.

Bryce 5 will be available in August at £195. An upgrade is available for £110. For a full review of Bryce 5, see Reviews, page 49.

■ A number of other applications

are also set to port to Mac OS X. A demo version of 4D 6.7 is available as a free upgrade, from [www.4d.com](http://www.4d.com)

Totally Hip's \$849 QuickTime 5 authoring tool, Livestage Professional 3.0 is also available as a free demo at [www.totallyhip.com](http://www.totallyhip.com).

ImageBuddy 1.4.1 for Mac OS X has been released by KepMad Systems ([www.kepmad.com](http://www.kepmad.com)). This is a digital-image layout program for Macs. It offers contact sheets and page-layout tools.

A preview version of file-transfer solution Timbuktu Pro is available for trial from Netopia ([www.netopia.com](http://www.netopia.com)). The \$29 application permits file transfer across multi-platform networks.

A beta of Toon Boom Studio ([www.toonboomstudio.com](http://www.toonboomstudio.com)) is currently available. This digital-animation package uses vector graphics to produce sharp, resolution-independent images.

TopCalculette Pro from RubenSoft ([www.rubensoft.com](http://www.rubensoft.com)) is an accounting and pocket calculator costing \$19. **MW**

**Dominique Fidèle**

## OS X 10.0.4 tackles key issues

Apple has updated Mac OS X to version 10.0.4. This multi-country release updates system software and beefs-up performance. It's the most comprehensive update of the operating system yet, according to Apple.

Compatibility with third-party USB peripherals has been improved. These include inkjet printers, self-powered

USB hubs, handheld devices, third-party mice and keyboard input-devices.

There are also improvements to iTunes' audio CD-burning performance, making it compatible with more third-party USB CD-RW drives.

The reliability of the Classic environment after waking from sleep has also been improved. Other general

enhancements permit third-party hardware drivers to perform better in the Classic environment.

There are two methods of download: the software update panel of Mac OS X; or as a direct download from Apple's Knowledge Base (See News, page 21).

**Dominique Fidèle**





# 2001 Outlook good for Windows-network Macs



## Napster goes legit with indie bands

Napster has inked a deal with The UK Association of Independent Music (AIM) and the Independent Music Companies Association (IMPALA), allowing it to offer users access to a major collection of independent artists when it launches its subscription-based service later this year.

AIM and IMPALA represent independent labels from across Europe, including Beggars Banquet, Warp, Mute and Telstar. Between them, these companies represent 26 per cent of the UK music-retail market.

Featured artists will include Muse (above), Moby, Tom Jones, Badly Drawn Boy, and Stereophonics. Napster has not yet revealed how much its subscription-based service will cost. **MW**

Microsoft has released a client version of Outlook 2001 for the Mac that enables Macintosh users to share scheduling and contact information with Windows users on mixed-platform networks equipped with Microsoft Exchange Servers.

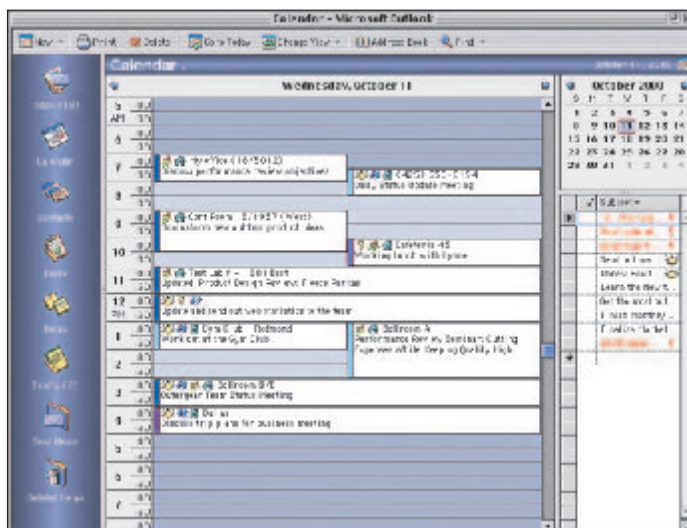
This is a major benefit for Macintosh users in Windows-based corporate environments. It's also the first time mixed networks have been able to share contacts and schedules using Outlook.

### Share options

The Outlook 2001 personal-information manager (PIM) should not be confused with Microsoft's Outlook Express email application, which features POP, IMAP and LDAP support.

One major feature of the release version of Outlook 2001 is its use of the same data format as the Windows version. It's this feature that permits users to share data, regardless of platform, over a network.

Outlook 2001 also offers a distinctive Mac-look, much like the interfaces for the Mac versions of Office and Internet Explorer 5. Outlook offers a Mac-only Themes customization tool that enables



users to alter the appearance of the interface. It also supports simple, drag-&-drop installation with password and ID security measures courtesy of Apple's Keychain.

Microsoft released a beta version of the Exchange client application at San Francisco's Macworld Expo in January.

This final build is more stable, with the calendar, import/export and integrated troubleshooting tools now fully enabled.

The Macintosh version is available for free download from [www.microsoft.com/mac](http://www.microsoft.com/mac). It requires 32MB of RAM and Mac OS 8.6 or later (though it runs only as a Classic application in Mac OS X).

Outlook 2001 for Mac requires access to a Microsoft Exchange Server to run. If you are a Mac user stranded on a Windows-driven network, contact your IT department to see if such servers are available on your network. **MW**

## Apple sued over old LaserWriter 'infringement'



Pitney Bowes has begun legal proceedings against Apple, Lexmark, Matsushita, Panasonic, NEC, Samsung and Xerox, accusing them of infringing its "272 patent" method for altering the dot size used to produce characters on a printed page. The company has already won \$400 million in damages from Hewlett-Packard over the alleged laser-printer infringement.

Apple's old LaserWriter range is among those products that supposedly infringe the Pitney Bowes patent, which predates the 1985 introduction of the LaserWriter.

The suit was filed on June 18. Pitney Bowes' deputy general counsel for Intellectual Property and Technology Law, Michael Melton said that the eight companies named in its suit aren't the only ones guilty of infringing Pitney Bowes' patent. "We are currently engaged in discussions with these companies, seeking a business resolution to these claims," he said.

Pitney Bowes manufactures mail and document-handling products and employs 29,000 people. Apple has so far declined to comment on the case. **MW**





## Apple targets Mac at US schools

Apple CEO Steve Jobs delivered the keynote speech opening the prestigious US National Educational Computing Conference in Chicago. Apple hopes to regain its number-one position in education sales.

Jobs said: "We're in education not just because we want to make revenue and profits, but because we give a damn."

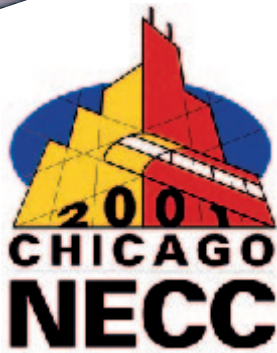
He announced three additional major US education districts that have adopted Apple's PowerSchool student-information system. PowerSchool is a Web-based system that lets teachers, administrators and districts manage and monitor student performance. Parents can also access the system through a Web browser to track their progeny's academic performance.

Apple's booth dominated the entrance to the exhibition floor. Apple presented its solutions for education – iBook, iMac and AirPort. Software solutions included PowerSchool, iMovie and iDVD.

"We believe that digital media can drastically enhance learning and fun," said Jobs. "Rather than bringing students to the computer, the new way is bringing computers to the students," he added.

Market analyst firm IDC predicts that notebook growth in the education market will surpass that of desktop systems by more than a factor of three. Jobs claims Apple is number-one in education notebook sales, with 26 per cent of the market share.

Mac OS X continues the role that Apple has always played in education and computing in general innovation, claimed Cheryl Vedoe, Apple's vice president of education.



Students who use innovative technology are better prepared for a technologically changing world, she said: "I had an interesting conversation with an educator who commented that students who use Macs in schools are better equipped for technology in the workplace, because technology is always evolving and Apple leads in innovation."

"We're taking the lead again with Mac OS X. It takes ease of use to new levels. When Apple looks at technology in education, we look at how that technology can be used in the classroom to facilitate teaching and learning. Educators shouldn't spend a lot of time on the technology itself."

And for those who think that Apple's dominance in the educational field is over, Vedoe would have them think again.

"We're dedicated to helping children reach their full potential," she said. "At Apple, education is in our DNA."

Apple is reorganizing its UK and European educational teams. Former managing director of Apple UK Brendan O'Sullivan moved to Europe in October last year to direct Apple's European strategy. He has now left Apple, replaced by the former head of Apple Switzerland. Apple UK had no statement available regarding its future UK education strategy as we went to press.

MW  
Dennis Sellers & Jonathan Evans

# A Macintosh family reunion

The first MacHack keynote I attended was the one I myself delivered a few years ago. The subject was the importance of maintaining core philosophies even as new technologies emerge, and how I built a Mac-controlled robot to torment my housemates' cat.

This year, MacHack upheld its commitment to schizophrenia through a rather incredible reunion of most of the big figures behind the development of the Mac.

When these people wake up in the morning, they have an excuse to roll over and slap the snooze bar – they've already justified their existence. They helped to birth something truly great, something that knocked the world on its ear and left it in a better shape.

That's underscored every time someone clicks on a menu and it drops down, every time someone selects something on screen and does something with it – hell, every time someone does something with a computer. Whether it's done on a Mac or Something Else, whether or not the Mac was the first machine to demonstrate such things, that's their legacy. The Mac proved it. It was their job to take all of the Great Ideas coming from Xerox PARC and the wild ones that were flipping through the ether, and turn them into a working, shipping product.

These geeks were the only people on the planet who didn't have the Macintosh to copy off of.

Bill Atkinson, Andy Hertzfeld and Jef Raskin, the guys everyone has heard of, were there. Together, they're the most notable figures behind the code burned into the first Mac.

Donn Denman was also there. He should be famous as the guy who designed the little lever in the Alarm Clock that rotated when clicked on and revealed the Mac's first drop-down window, as well as the Note Pad, whose animated turning pages triggered my first sense that a Macintosh was something I Simply Had To Own.

There's no need to try to be clever in describing it: this keynote was

manifestly special and wonderful. The evening was filled with plenty of anecdotes about incidents known and incidents as-yet-unfold about the Mac's development.

Bill Atkinson talked about a feature he'd actually put into MacPaint – a slick way to identify any text within the artwork and make it editable. The user draws a selection around the text, MacPaint finds the edges of the letters, makes an educated guess about what font it might be, and then by just determining which character makes that glyph disappear, you get the text.

But he yanked out the feature later. As limited as that feature was, it'd still be a Text-Editing Feature, and that would imply that MacPaint would have use as a word processor...

Atkinson wrote MacPaint with clear, confident intentions on what he was creating, and any feature that would blur that experience for the programmer would almost certainly obliterate it for the user.

## Mac legacy

As the years scroll by, various myths about the Mac's development get clarified or discounted altogether, but one thing that seems built on bedrock was the sincerity of the project. These people really did believe they were building something revolutionary, something that would be truly great... that they were creating a legend and a legacy, and what they were doing there would be in the lead paragraph of their obituaries.

They Got It. From top to bottom, They Got It, and they knew that what they were doing was right, just as the stories claim they did. And just like the engineers working on the Apollo moon programmes, they were determined that if this project went wrong – or leaned toward suckage – it would not be due to anything they had done.

Why was there no second button on the mouse? Because as hard as they tried, they couldn't come up with That One Concept that the second button should represent.

## MacHack 2001. Andy Ihnatko reports.

Button 1 means "select" in every app and in every situation. But a Button 2 that means different things to different programmers is mere surplus and could only serve to gum up the works.

The MacHack panel was like an assemblage of people who participated in the production of *Citizen Kane*. Partly because these were people who were aware that they had been a key contributor to something that will live on forever; partly because they'd done it long enough ago to have perspective, to be able to judge the actions of young people through the prism of decades' worth of experience.

## Steve's virtual presence

But the thing that really invokes this comparison is the fact that Orson Welles is exactly as likely to show up at any modern panel about *Citizen Kane* as Steve Jobs was to show up at last night's keynote about the Mac. The iSteve that we all know and love would never want to come that far to be one of six people on a stage.

Like the empty chair set aside for Elijah at a Passover dinner, though, Steve's presence at the keynote was very, very real through the many anecdotes delivered by the panel.

"A common phrase we'd use on campus was 'Hey, Steve! Wait until you hear about this great idea you just had!'" joked Randy Wigginton (Apple employee No. 6).

Tale after tale firmed up my existing resolution to never assume that any story was "Too 'Steve' even for Steve." Bill shared the story about how Steve insisted that rounded rectangles be one of the Mac OS's graphics primitives. He balked, but Steve insisted that the two of them go out for a walk... and damned if he didn't demonstrate that RoundRects are everywhere in nature.

Bill wanted to communicate how gifted Steve was at seeing subtle but important points. And the tale worked wonders until Jef informed him that he'd sold Steve on RoundRects in exactly the same manner not too long before.

Not showering. Firing an engineer after hearing secondhand that he didn't believe a mouse was really possible. Installing himself as Apple Employee Zero in a fit of pique after losing out as Apple Employee One. You'd think that the panelists were painting a picture of a Montgomery Burns of *The Simpsons*, and that iSteve was only a few years away from clomping around the Apple

campus wearing empty Kleenex boxes for shoes.

But the real point of all these tales was that, as odd as Steve is, he's just Steve. He is all of those things, but even if he does receive his inspirational breakthroughs only after they've passed through the neurological alimentary canals of others, his ability to zone in on The Right Thing

and to fix it into a coherent form with other Right Things is uncanny. If Steve isn't by any stretch a brilliant scientist and engineer, he's a brilliant leader and manager. Walt Disney wasn't a brilliant animator, but Walt Disney Pictures wouldn't have produced such reliably great work without him.

The keynote lasted five hours and then some. When Andy Hertzfeld and others agreed to stick around to chat, dozens of MacHack denizens ringed the stage. I wanted to be one of them, but I had boarded my 8:40 flight that morning with only 118 minutes of sleep under my belt. One of my subsystems turned on a little orange indicator light mounted in the corner of my eye, which meant that there were only 20 minutes of power left and I would begin shutting down.

I had hoped that I could shake all of these people's hands and in some quick and non-12-year-old-girl-standing-outside-MTV-Studios-And-Screaming-Because-The-Backstreet-Boys-Are-In-There-Somewhere way communicate how grateful I was that they had so adamantly applied their passion and their creativity and their dedication to the Macintosh project.

This, I could not do. But Bill Atkinson came down with a splitting headache, and I was able to give him some Tylenol from my satchel. So I feel as though I've made my gratitude known.

MW



## Steve Woz there, too

Apple co-founder Steve Wozniak gave a fireside chat at the MacHack conference. 'Woz' talked about Apple, his children, his history at Apple and his many, many pranks. Later, Woz took questions from the audience, where among other things, he speculated on an Apple PDA.

Woz still receives a nominal paycheck from Apple, and also gets the latest hardware. He says that he wants to be an Apple employee his whole life. He believes that the Cube is one of the best computers ever designed, and that the Titanium PowerBook is the best ever.

Of his co-founder, Steve Jobs, Woz said: "Jobs read it in a book somewhere that there are special people in the world who do everything, and there are those who do nothing. Jobs wanted to be one of the people to do everything."

Woz said that he was never mistreated by Jobs, and that he left Apple equitably and without any bad feelings. However, he also said that Jobs is motivated by control.

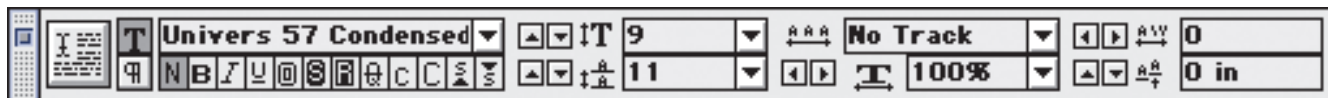
"Jobs wanted power, and he left Apple to get it." Jobs charged Apple \$400 million for NeXT. "Jobs told me that Apple shouldn't have paid that much, but I now understand that Jobs had to represent his shareholders," said Woz.

Woz did once pull off one of his famous practical joke on old-buddy Jobs, but "some people are better targets than others," he said. MW  
David Read



From left to right: Randy Wigginton, Donn Denman, Caroline Rose, Andy Hertzfeld, Bill Atkinson, Jef Raskin, and Daniel Kottke.





# PageMaker 7.0 revived by PDF



## Maya boss exits

Richard Kerris, director of Maya Technologies, has left Alias|Wavefront – maker of the industry-leading 3D modelling/animation app, Maya (see page 95).

Eight other staff also left the company. The Maya Macintosh development team is still “hard at work” producing the Mac OS X version of Maya, Kerris told *Macworld*. Kerris became synonymous with Maya for Mac – often appearing on stage with Apple CEO Steve Jobs at Macworld Expos.

It's possible that the nine departures are attributable to cost-cutting in an attempt to boost profits and meet expectations in a softening market. **MW**

Many products claim to be revolutionary, but the first version of PageMaker truly was. When PageMaker 1.0 was released in July 1985 – a year after the Mac's debut – it ushered in the era of desktop publishing and helped make the Mac's name.

For many years, PageMaker was DTP's killer app. But as parent company Aldus languished, so too did the program. QuarkXPress assumed PageMaker's role as the desktop-publishing program of choice. By the time Adobe swallowed up Aldus in 1994, PageMaker had become an also-ran in the professional market, although the application remained a favourite among small business and home users.

PageMaker's last so-called “substantial update” came in 1999, but was considered by most industry watchers to be only a minor revision. The 1997 upgrade to version 6.5 was described as “the plodding PageMaker” that “may set the tortoise and hare parable on its ear by losing the race to the leaps-and-bounds approach of QuarkXPress”. Thus, version 7.0 marks the first dramatic revision since the mid-1990s.

PageMaker 7.0 will allow users to perform several functions that previous versions didn't. One is the ability to create tagged Adobe PDF



files. When users export a PageMaker document to PDF that is going to be seen in print, on the Web, or in eBook form, they have to lay it out only once rather than optimizing it for each place it will be seen. Essentially, the feature lets users separate the design of a document from its content.

PageMaker 7 also permits users to create highly customized documents via its new data-merge feature. With this tool, users can drop custom fields into a standard template – a tremendous boon to anyone looking to create small-run printed documents that each need unique fields, such as in a targeted advertisement mailer.

However, the Mac version of PageMaker will be missing some features that Windows users will enjoy. The Windows version has a Picture palette for browsing and managing stock illustrations, clip art, and photos in a wide variety of formats. It also has a Template Browser for searching and managing

templates, as well as a Microsoft Office-like toolbar. The Mac version also lacks the Microsoft Publisher 97, 98, and 2000 conversion kit.

## Third wave

Adobe's additions to PageMaker fit the company's network-publishing initiative (see page 22), which aims to help users move custom content in multiple formats across multiple platforms. In essence, Adobe believes that network publishing will enable designers to produce content that looks as good on the Web as it does on a PDA or printed page.

Since Adobe already targets InDesign toward the pro DTP user, the company hopes PageMaker will fill the gap for small business and home users who need to use more page-design tools than Microsoft Word can offer. Available this summer, it costs £399; £59 as an upgrade. It runs in Mac OS 8.6 and higher, but not in the native layer of Mac OS X. **MW Mathew Honan**

## Preflighting takes off

Extensis has announced the addition of automated file delivery to its Preflight Online (www.preflight.com) service. The integrated FTP service lets customers check, collect and transmit digital print jobs over the Internet using a browser. The company has also updated Preflight Pro to version 2.2.

Preflight Online looks for common, and not-so-common, print errors – such as missing fonts and images, bad colour calibration, and low-resolution JPEGs. It's secure, as the documents don't need to be uploaded for the pre-flight check, according to Extensis. No additional software is required for the check other than a small plug-in for a browser.

Extensis has added the FTP service so customers can despatch documents directly

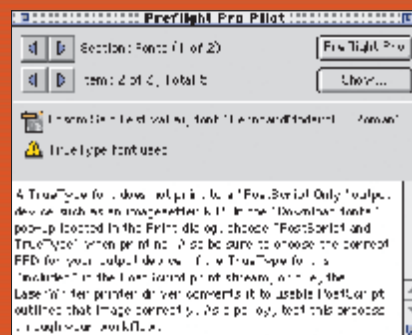
to a print bureau using Extensis' servers.

Extensis' senior product manager (and former *Macworld* contributing editor) Joseph Schorr said: “While many printers currently host FTP servers, getting customers to install, configure and use FTP software is a challenge. Preflight Online removes this obstacle by making file submission as simple as clicking a Send button.”

The Preflight Online service will check both QuarkXPress and Adobe PDF formats. The company promises to add more formats over the coming months.

Preflight Pro 2.2 checks QuarkXPress, Adobe Acrobat PDF, PageMaker, Photoshop, Illustrator, and Macromedia FreeHand documents for errors.

Preflight Pro 2.2 now supports Adobe Illustrator 9 – allowing users to inspect files



for possible problems, and get a report on all fonts, colours and embedded images used; see screen above.

Preflight Pro 2.2 contains a completely new PDF inspection engine, which can now directly read and inspect PDF files, without having to launch Acrobat. **MW**



# Party on, Sims



## In the house

Three party types are available in the pack: western dance, rave and beach party. You purchase the relevant costume trunk, and partygoers dress themselves up to fit the occasion.

Players can buy food to keep the party guests positive – turkey, cake, etc – but as ever in *The Sims*, cooking with fire is always a very real danger.

Aspyr will ship *The Sims House Party* at the end of July – another slice of simulated sociability for the legion of Mac Sims players. In *The Sims*, players control individual characters in a neighbourhood of households. Players must organize every aspect of the Sims' lives – including sleeping, eating, working and leisure time – to keep them happy and successful.

The game has spawned a huge online community. As with the recently released *The Sims Livin'* Large expansion pack, *House Party* doesn't change the basic game-play. However, *House Party* does provide all the essential ingredients you need to persuade your Sims to let their virtual hair down.

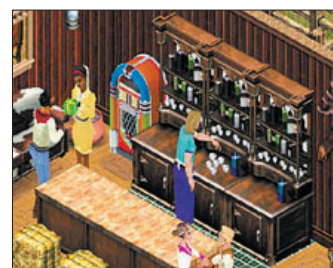
## Celebrities and squares

New objects for the well-heeled Sim include illuminated dance floors, huge DJ rigs, hanging dance cages, mechanical bulls – which improve strength and social skills – camp fires and bubble makers. With some careful micro management the virtual party guests can be tucking into buffets and supping punch from the bowl. A variety of new rugs, furnishings and other household items are also available to complement the shindig.



Players can employ caterers, cake dancers, and strippers; celebrity guests can even make an appearance, emerging from impressive stretch limos to join the throng. Just like any party, you can also get gatecrashers, who'll abuse your neighbours and eat your food. Players should be prepared for a variety of different ghosts and surreal disaster scenarios.

The expansion kit offers players the chance to custom-build their Sims' houses to host a party. You can install vast dance floors, huge bars and a selection of hot tubs. Despite the opportunities to let *The Sims* have some fun, the game still requires that they hold down their day jobs and stick with their routines.



*The Sims House Party* will be available at the end of July for £25 (SoftLine, 01883 745 111). The expansion pack requires that the original title, *The Sims* (£39) be installed. It runs on any G3 or higher Mac.

MW

Jonny Evans

# Ring ding-dong

Graphic Simulations' newest title, *Summoner*, is set for a Mac release. Its publisher, THQ, is also responsible for the hugely popular titles *Descent* and *FA18 Hornet*.

The role-playing game introduces Joseph of Ciran, a born Summoner who is capable of calling up elemental creatures, demons and dragons to serve him. His task is to stop the evil emperor Murod from ruling the universe. With a band of adventurers, Joseph begins a global quest in a variety of different terrains as he seeks magic rings – the source of his power.

Players can control up to four different characters in the game, and Joseph can summon creatures to help him in battle. There are plenty of animated scenes to add life to the game, and much of the game-play relies on non-violent interaction with non-player characters (NPCs). Players must collect equipment, brave variable weather conditions and engage in battle using the built-in combat engine. Locations are packed with beautifully rendered OpenGL visuals



including castles, grassy hills, lakes, and water-texture effects. Each city hosts hundreds of NPCs and a variety of side adventures in a fully explorable environment.

The Mac version supports OpenGL and Glide. *Summoner's* developer promises the game delivers "astonishing" graphics, 3D environments and a rich role-playing game storyline.

Already available for the PlayStation and Windows platforms, the £38 Mac version of the title is now in production, and will reach UK game outlets this month.

MW







# Adobe bucks IT trend

**A**dobe Systems bucked industry trends with its second-quarter results, exceeding analysts' earnings expectations with a 15 per cent rise in revenues. "Given the tough economic environment, I am extremely pleased with our financial results," said Bruce Chizen, president and CEO of Adobe.

The news is a welcome respite for the beleaguered tech sector, in which companies are queueing to deliver disappointing results for the current quarter. Apple is another company doing well. It is likely to meet its targets for the current quarter, thanks to buoyant sales of its new iBooks and PowerBooks continue to sell well in an otherwise ailing market.

Goldman Sachs expects Apple's shares to "outperform over the next few months as product cycles should allow them to buck the downward trend in the industry". Goldman forecasts a 30 per cent rise in Apple's stock price over the next six months, citing notebook sales.

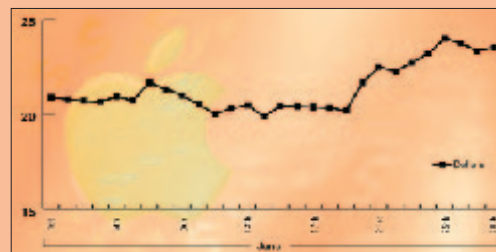
Analyst statements on Apple continue to maintain that company's stock price. Most recently, Morgan Stanley Dean Witter announced that: "Recent channel checks suggest Apple will come in at or just slightly below our top line number of \$1.6 billion." The firm congratulates Apple on the performance, calling it "a good result in a very tough market".

Meanwhile, Wall Street brokers First Call/Thomson Financial estimate that Apple's current channel-inventories are in the three-week range, but predict that this will rise to four weeks by the end of the quarter.

Discussing Adobe's results, Chizen said: "Our solid financial performance in the quarter was driven by record revenue for Adobe Acrobat 5.0, which drove 67 per cent year-over-year growth in our ePaper Solutions division."

Adobe expects next-quarter revenues to be unchanged from a year ago, but warns that market conditions could decline if the economic slowdown spreads from the US to Europe.

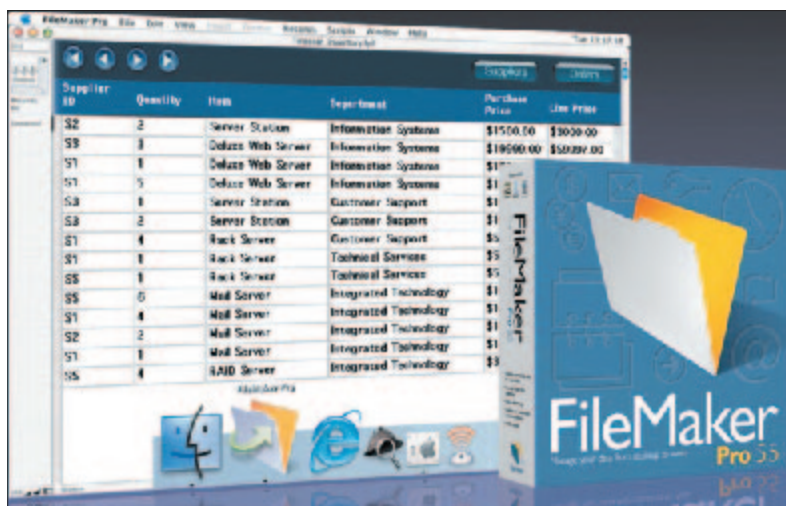
Adobe hopes fourth-quarter growth will be spurred by





See 'Macworld' – inside 'Serious Software' – on this month's cover CD

# Product News



## Carbon File app

**F**ileMaker 5.5 has been Carbonized for Mac OS X, while remaining compatible with OS 8.1 to 9.1. The OS X version makes use of the Aqua interface.

Interface and data fields are customizable in FileMaker 5.5, which will handle a wide variety of data records, including contacts, video, images, and graphics. It can also operate on cross-platform networks and permits PDF files to be stored in container fields (in OS X).

It offers record-level security and server-related features, so it's a secure solution for corporate environments. Security operates on multiple levels – from password protection for accessing data, to individual permissions for different records.

FileMaker 5.5 integrates fully with Office 2001 and Excel. The databasing application also uses the QuickTime

graphics engine to translate foreign graphics formats into displayable images.

FileMaker Pro databases can be published to the Internet instantaneously, supporting scripts, table views and JavaScript-based button rollovers. FileMaker Pro 5.5 also supports ODBC (Open Database Connectivity), which means that exchanging data with other users and applications is simple.

The company also announced two forthcoming versions of its database application: FileMaker Server 5.5 and FileMaker Pro 5.5 Unlimited. They will offer enhanced functionality and advanced features. They will be released in the summer. A single licence for the full version costs £219; the cost of multiple site-licenses varies.

**FileMaker, 01628 534 158**

## Iomega drive tops class

Iomega is shipping its Peerless removable drive – which is about the size of a Palm PDA, and slips into a base station about four-inches across and five-inches tall.

The drive is available in both 10GB and 20GB varieties, and can be used with Macs and a selection of other devices, possibly in-car audio systems in the future. Iomega is positioning the drive as a faster, affordable alternative to optical-drive technologies, such as CD-RW and DVD.

It features chip-based "identifier technology" that can be used to secure data from unauthorized use. Iomega said it created the drive by integrating read/write heads into sealed 10GB and 20GB removable disks. The device will have "an expected" data transfer rate of 15Mbps when used with a FireWire connection.

Both FireWire and USB 1.1 interface modules are shipping now, with USB 2.0 and SCSI modules available later. Peerless ships with a base unit and a single storage cartridge. The Peerless 20GB bundle will cost £340 for both FireWire and USB models. The base station on its own costs £230. Disks cost £135 for the 10GB version, and £170 for 20GB model.

**Iomega, 020 7365 9527**

### X-files

Apple subsidiary FileMaker has launched Mac OS X-native FileMaker Pro 5.5, which allows scripts to be attached to its buttons and used on a Web site.



## Kodak's pro 10GB camera

Kodak has launched its professional grade DCS 720x digital camera. The 2-megapixel 36-bit colour camera offers ISO settings between 400 and 6,400, and shutter response times equal to traditional film cameras. It has FireWire connectivity and an LCD viewfinder. Features include post shot exposure compensation, white balance controls and a choice of storage options, including a dual PC card-storage interface and 10GB internal file-storage. Direct email image transmission over a mobile will also be available later this year. Pricing was unavailable at press time. **Kodak, 0870 606 1423**

### Font fix fillip

FontAgent version 8.5 locates, analyzes and reports the condition of all fonts. It then fixes fractured fonts, rejoins font families, eliminates duplicates, and reorganizes the font library. The full version costs \$29.95

Insider Software, [www.insidersoftware.com](http://www.insidersoftware.com)



### Dual-monitor card ships

AM Micro has become the sole UK distributor of VillageTronics' Desktop Doubler Graphics Card.

The card allows two monitors to be connected to a PCI Mac, splitting the desktop across two

displays, and is aimed at digital-video and graphics professionals. It drives one monitor, while the Mac drives the other. It holds 8MB of dedicated VRAM, fits into a Power Mac's PCI-slot, and costs £59. (See Reviews, page 66.) **AM Micro, 01392 426 473**



### Supermarket leap

UK company Dragon Solutions has introduced the ImageTeam 3800i bar-code reader for USB Macs.

The reader is available in purple, red, orange, turquoise, blue and green. It's a linear imager, and its high-resolution optics mean the device scans at 270 times per second with no moving parts. The product ships with a five-year warranty and costs £645.

**Dragon Solutions, 0161 439 0610**



### BEditLite readied

BEditLite is Bare Bones Software's newly released free text-editor for the Mac, focused on helping Macintosh users prepare content for the Web. It dispenses with many of its parent application's features, but is already becoming widely regarded as the "best freeware text editor available".

Bare Bones Software, [www.barebones.com](http://www.barebones.com)



continues page 40



## CDs & books

### Mac-beth

4Learning is publishing Shakespeare's Macbeth, an educational tool for secondary schools. It contains clips of Macbeth starring Greta Scacchi. Two CDs cost £47; five additional CDs cost £11.75 each. 4Learning, 01926 436 444.

### Web commandments

The *Dreamweaver 4 Bible* is a guide to Macromedia's Web-development application. The book looks at the basics of Dreamweaver, Dynamic HTML, XML and other technologies. The £27.99 book ships with a CD containing trial versions of Dreamweaver 4. It's available at up to a 30 per cent discount from *Macworld* ([www.macworld.co.uk/readersoffers](http://www.macworld.co.uk/readersoffers)). Macworld, 020 7831 9252

### Carbon dating

O'Reilly's £24.95 *Learning Cocoa* and *Learning Carbon* teach Apple developers key Mac OS X programming skills. *Learning Cocoa* familiarizes readers with Cocoa – the application environment for Mac OS X. *Learning Carbon* introduces developers to system-level occurrences, including resource handling. O'Reilly, 01243 843 202

### Present perfect

Softase is launching Textease Presenter. This presentation pack can be connected to electronic white-boards, projection systems and computer screens to create multimedia presentations. Digital photos, video, sound, and text can be used with this presentation tool. Textease Presenter costs £39 for a single user; multi-user licenses cost £10 per node. Softase, 01335 343 421



## Arty facts

Heritage Image Partnership is a new group developed to create a picture library of images from the collections of Britain's leading museums and art galleries. Pictures are available to view online ([www.heritage-images.com](http://www.heritage-images.com)), and reprographic licences can be bought over the Web. This image is taken from the British Library. Images are also available from the collections of: the National Museum of Photography, Film and Television; the Science Museum; the Guildhall Art Gallery; and more. Prices are negotiable, but start at £65. Heritage Image Partnership, 020 7929 5581

# CD drive ships

Formac has released two storage products – a 24x-10x-40x Designer Series drive and a combination CD-RW/DVD-ROM drive. The new products follow Formac's April release of 16x, 12x and 8x speed CD-RWs.



Formac's FireWire-connected CD-RW integrates the company's BurnProof technology, which it claims minimizes the chance of wasted CDs caused by buffer-underrun errors. It also compensates for slower source-drives, and lets users burn CDs in the background.

The company is also launching the Designer Combo 12x-10x-32x-8x CD-RW/DVD-ROM drive. This will play and burn CDs, and play DVDs. It also integrates Formac's BurnProof technology and FireWire connectivity. The products both ship with Roxio's Toast 4.1.2 and cost £269.

Formac, 020 8533 4040

# iRez captures Mac USB images

iRez Technologies is shipping its CapSure USB device in the UK through distributor AM Micro. It costs £100 and allows USB-enabled Macs to capture 640-x-480-pixel still images, and up to 320-x-240-pixel video images. It's a connectivity solution to transfer data from VCR and DVD recorders, video cameras and professional cameras, and also transfers sound data from stereos and tape decks for on-the-fly video editing.

CapSure USB features two video inputs, composite and

S-Video, and two audio inputs – one left and one right channel. The device can overlay different signals, and ships with Reel-Eyes video-capture and editing software. Powered through the USB port, the product supports the PAL, NTSC and SECAM standards.

AM Micro, 01392 426 473



# LaCie puts DLT back into storage

LaCie has announced its 11MB per second (MBps) SuperDLT Drive in the UK, as well as its Dupli-125 CD duplicator. The SuperDLT Drive offers 220GB compressed capacity on each cartridge.



The drive is backward compatible with earlier DLT tape drives, which offered one-third the capacity of this version.

The drive costs £3,395 and is Mac, Unix, Linux, NetWare and Windows-compliant.

The Dupli-125 is a CD duplicator equipped with one DVD-ROM drive and five 12x-10x-32x drives. It will record five CD-RWs in under six minutes, according to LaCie. The duplicator has built-in error-correction features to prevent faulty CD-burning sessions. The Dupli-125 costs £1,795, and is available through LaCie's accredited resellers.

LaCie, 020 7872 8000

# Filmic cameras summer snap

Minolta has released its summer collection of high-spec digital cameras – the DiMage 5, 7, E201 and S304.

The DiMage 5 and 7 both have a 7x digital-zoom, are supported by a high-speed imaging chip, and include an auto-focus and an auto-exposure system. They also come with an automatic flash and a number of camera-sensitivity controls – which emulate different film types, according to the company. The cameras can also capture sound and short movie-clips.

The £850 DiMage 7 has the highest resolution of any consumer digital-cameras, according to Minolta. It has a 5.24-million-pixel CCD (Charge Coupled



Device). Its images are big enough to print at 150dpi at A3 size, and it has a focal length of 7.2 to 50.8mm – the equivalent of 28 to 200mm lenses on 35mm cameras.

The £680 DiMage 5 has a 3.34-million pixel CCD, offering B4 size prints at 150dpi and 13-x-17cm prints at 300dpi. It also offers the digital equivalent of 35mm cameras' 28 to 200 mm lenses.

The £254 DiMage E201 hosts a 2.3-million pixel CCD. It offers a focal length of 8.2mm and a digital zoom of 2x or 1.4x magnification. Images can be viewed and edited on the camera's colour LCD-monitor, either individually or using a nine-thumbnail-image display. Images can be magnified up to three times on the LCD.

The PAL and NTSC-compatible camera hooks up to a TV or other compatible viewing device for checking pictures. This model ships with Adobe PhotoDeluxe.

The £299 entry-level S304 has a 4x zoom. A 2x digital-zoom doubles the optical zoom. It hosts a 3.34-million pixel CCD.

Minolta, 01908 200 400



### Image conscious

Minolta's summer collection of cameras features the DiMage 5 (above) DiMage E201 (below) and the DiMage S304 (below, left). The S304's images can be printed at B4 sized at 150dpi, and at 13-x-17cm (5-x-7-inch) photo-quality at 300dpi. Both the DiMage E201 and the S304 can record 60-second movie clips.



# Burner travels to UK

Freecom has introduced its range of Traveller CD-RWs. The company claims they are the "world's smallest CD recorders". They measure 145-x-145-x17mm (5.7-x-5.7-x0.7-inches). The range includes the USB £204 Traveller II CD-RW and the £238 FireWire Traveller II CD-RW. Also available is a CD-RW/DVD Combination Traveller II (price TBA), the £85 24x CD-ROM, and Traveller II 8x-24x DVD-ROM (£170).

The CD-RW unit is available as a 4x-4x-20x speed model in blue, or in a grey 8x-4x-24x drive. The CD-RW/DVD Combo is an 8x-4x-24x-8x drive. The grey unit offers both CD-RW and DVD playing functions.

All the drives ship with Roxio's Toast 4.1. A rechargeable power module, which offers six hours of independent use, is also available for £28. Freecom, 01423 704 700



### Travel companion

The Traveller II CD-RW drive includes FireWire connectivity, with USB 2.0 "coming soon".

# CD drive 'burn-proof'

One Technologies has launched its 24x-10x-40x FireWire CD-RW. The device integrates a technology that ensures optimum burn speeds, called SpeedFlex SS-Burn Proof Technology.

It burns at 10x and reads CDs at up to 40x. The drive supports CD-authoring applications, including Roxio's Toast. CD-authoring software, however, doesn't

ship with the product, though some dealers may include it.

It costs £289, ships with a FireWire cable, a manual, software drivers, one CD-RW disc, and a one-year warranty. One Technologies, 01223 507 700



### One time

One Technologies CD-RW drive supports all common CD formats.

### Canon shines on

Canon has introduced the £2,999 LV-7105 video projector. It offers an Extensible Graphics Array (XGA) resolution of 1,024-x-768 pixels, weighs 2.8kg (6.27lbs) and has dimensions of 189-x-75.5-x-310.8mm (7.5-x-2.9-x-12-inches). It will connect to most DVD players and many games consoles, and offers S-video inputs for other video sources. The projector also has Digital Keystone correction features to help compensate for image distortion. Canon, 0800 616 417



### Card reader holds key

SCM Microsystems/Microtech has launched its ZiO! Card reader. This compact, keyring-sized card reader plugs into the USB port of Macs. It's available for CompactFlash, SmartMedia, MultiMedia and Secure Digital memory cards, and costs £25. SCM Microsystems, 0118 932 1613

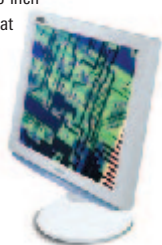
### Get files sorted

Script Software's iView MediaPro version 1.0.5 is a media-management tool for Macs. It will organize, find, view, play, print and convert over 30 media formats. Compatible with most digital cameras, it can export as HTML using templates to make Web sites of media files. It supports drag-&-drop under Mac OS X, and has a slide-show option. The full version costs \$45. Script Software, [www.scriptsoftware.com](http://www.scriptsoftware.com)



### Sharp looking

Sharp has introduced the LL-T1810A, an 18-inch LCD monitor. Priced at £1,320, the monitor combines Sharp's Black TFT anti-glare reflection technology with ICC Profile colour-management technology. The monitor has a resolution of 1,280-x-1,024 pixels and a vertical- and horizontal-viewing angle of 150 degrees. It ships with a three-year warranty. Sharp, 0800 138 8879





## Apple updates

Apple has released some key updates in the past month.



**Mac OS Runtime for Java 2.2.5**, available using the Software Update Control Panel, is Apple's most robust implementation of Java yet. The **iBook Audio 1.3.6** improves sound output on new model iBooks. **QuickTime Streaming Server 3.0.1** adds skip protection and improves Web-broadcasting support. **Authoring Support 1.1** installs new drivers for iTunes, and **Disc Burner** increases compatibility and extends the number of external CD-R Drives supported. Visit [www.macosworld.co.uk/updates](http://www.macosworld.co.uk/updates) for links to the updates.

## Third-party updates

**Office 2001 for Mac Service Release 1**

This is a collection of product updates for the applications found in Office 2001. It provides the latest fixes and improves compatibility and support for Mac OS 9.1. Microsoft recommends it for Office 2001 users.

**Word 98 & 2001 Security Updaters**

This update prevents malicious code hidden in macros from opening without a security warning. When installed it's still possible to use templates, macros and RTF files.

**Griffin iMic Control 1.2**

This provides additional features and controls for the iMic USB-audio adaptor. It allows the control panel to continue to be used with the Rev 2 version of the iMic with other fixes that may make the control panel more robust. It provides output control over treble, bass, volume, balance, and mute, as well as input control over audio gain.

**LaCie Silverlining 6.4.2**

The latest update for LaCie's hard-disk management solution fixes a number of bugs, and improves management of FireWire disks and RAID arrays. It also makes PocketDrive disk management more robust.



## Video gaga

JVC's GR-DVX44 (above), GR-DVP3 (below) and GR-DVP1 (right) are the company's latest digital-video offerings



# JVC mini-cams a DV boon

JVC has released its summer collection of mini DV-cameras. The range includes the GR-DVX44 DV camera, and the GR-DVP3 and GR-DVP1 miniature DV-cameras.

The £680 GR-DVX44 digital camcorder has an 800,000-pixel CCD, and a 2.5-inch high-resolution colour tiltable LCD-monitor. The camera starts automatically when the viewfinder or LCD is opened. Zoom capabilities include a 10x optical and 200x digital zoom. The latter uses "spline interpolation" to smooth contours and minimize jagged edges. It has a built-in image-stabilizing function to protect against camera shake.

It also includes JVC's Digital NightScope function, which enables full-colour filming in the dark, according to the company. The camera will capture 2-channel 16-bit audio, or 4-channel 12-bit audio, and has a number of digital effects and transitions built-in. It has a single FireWire DV out port.

The GR-DVP3 and the GR-DVP1 miniature DV-cameras also employ 800,000-pixel CCDs. They offer 520 lines of horizontal resolution, and measure

43-x-115-x-80mm (1.7-x-4.5-x-3.1-inches). They have 10x optical zoom and 100x digital zooms. The 0.44-inch electronic colour-viewfinder displays images on both models.

The £1,200 DVP3 (two FireWire DV In/Out ports) and the £1,100 DVP1 (a single DV Out port) also offer a number of built-in effects to apply to video as it's captured. They also include an MPEG-4-Video-Clips-for-email function, which creates instant video clips viewable on most Macs. The cameras are equipped with SD memory slots, and ship with 8MB SD Memory Cards to carry digital stills, video clips and sound effects to and from a Mac.

All three JVC DV cameras ship with software including Presto!PhotoAlbum, Presto!MrPhoto and Presto!ImageFolio. **JVC, 0870 330 5000**



# Projectors light way

Mitsubishi Electric has released its XD10U and SD10U projectors. The portable projectors use digital light-processing technology to cast images. The units measure 198-x-62-x-245mm (7.5-x-2.4-x-9.6-inches), weigh 2.27kg (5lbs) and offer a brightness of 1,200 ANSI lumens.

Other features include digital keystone-correction, a remote control with a laser pointer, and a multi-lingual on-screen menu.

The XD10U has an XGA resolution of 1,024-x-768 pixels and costs £3,500, while the £2,500 SD10U delivers an SVGA resolution of 800-x-600 pixels.

**Mitsubishi Electric, 01707 278 684**



# Kensington's mouse infestation

Kensington has launched a new range of peripherals for USB Macs. The collection includes the Orbit Trackball, Mouse in a Box for Macs, and Turbo Trackball mice.

The graphite-coloured Orbit Trackball costs £69.99, and is designed for left and right-handed users. It uses user-customizable MouseWorks software.

The £128 Turbo Mouse Trackball is also graphite coloured. The large trackball mounted on stainless-steel bearings for smooth tracking and maximum durability. It also features four programmable buttons that can perform various off-repeated tasks. Kensington has also released the straightforward £45 single-button graphite Mouse in a Box.

**Kensington, 0800 252 359**



## Outer space

The Orbit Trackball (above) is ergonomically designed for left- and right-handed users. The USB Mouse in a Box is pictured left.



## Sporty heights

ImageState has released the Adventures collection, which consists of a wide variety of sports-action photos. The collection includes images of skydiving, bungee jumping, white-water rafting, base-jumping, sky-surfing and mountaineering.

Image usage costs vary, with royalty-free prices starting at £35, but can go up to £1,000s. Royalty-free CD image collections start at £150, and contain 60 to 100 images. They can be viewed at [www.imagestate.com](http://www.imagestate.com). **Imagestate, 020 7734 7344**

# Sony's slim monitors

Sony has released its summer collection of flat-screen, TFT (thin-film transistor) monitors – the SDM-N80 and SDM-M81. Both models have maximum resolutions of 1,280-x-1,024-pixels. The SDM-N80 offers a 350:1 contrast ratio, while the SDM-M81 sports a 300:1 ratio.

The monitors are equipped with both analogue and digital ports, and can accept input from two Macs; either with an analogue graphics-adaptor, or from one analogue and one digital input.

The SDM-N80 features an Intelligent Auto-Adjustment function to optimize picture quality. This model also has some built-in energy-saving features.

The SDM-N80 has two upstream and two downstream USB ports.

The SDM-M81 can be tilted to a 70-degree angle, and will swing from side-to-side on its swivel base. The SDM-N80 is priced at £1,699, while the SDM-M81 costs £1,099.

**Sony, 08705 424 424**



## Eye candy

The Sony SBM-N80 (above) has a USB hub and built-in speakers. The SBM-M81 (below, left) also has built-in speakers and comes on a swivel stand.



## Font viewer ships

Code Line Communications has released the \$24.95 Art Directors Toolkit 1.1. The application is full of features for designers. It will view every character in a font. It can also identify the point size of a 0.125-inch Helvetica character. It figures out fractions, point sizes and converts points to picas. **Code Line Communications, www.code-line.com**



## Archos Jukes it out

The £254 Archos Jukebox Recorder is a 6GB hard drive that holds up to 100 hours of music in MP3 format. MP3 recordings are made in real time from any analogue or digital-audio source, including CD players. Encoding speeds reach sampling-rates of 128-160K per second. It connects via USB, has a backlit display panel, rechargeable batteries, and stereo headphones. **Archos, 01672 810 366**

## Borris FX updated

Boris FX 6.0, the non-linear special-effects processing solution, is available now. New effects include Snow and Rain, Shattering, edge lighting and spotlights. The interface has been improved for better navigation, and the application is optimized for AltiVec and OpenGL. Premiere 6.0, Final Cut Pro (1.0 and 2.0) and After Effects are all supported. It's available online for \$495; upgrades from previous versions cost \$199. **www.Borist.com**

## Shape Photoshop

Sapphire Innovations has released its fourth collection of custom shapes for Photoshop 6.0. The shapes can be used with layer effects, combined to create custom shapes, and warped or transformed. Shapes include polygons, patterns and more. The collection also works with Adobe's Photoshop Elements. It's available for Mac and PC, and costs £17.99. **Sapphire, www.sapphire-innovations.com**



# Burn baby, burner

Amacom has released the 4x-4x-24x Baby CD-RW.

This portable drive is available in either USB or FireWire configurations. Its mechanism is supported by DiscBurner and iTunes.

A blank CD-RW, CD-R and Toast 5 Platinum are supplied with each Baby CD-RW. Three bundles are available with different connection interfaces: the USB cable bundle costs £188; the FireWire £213; and the combined FireWire/USB version costs £233. **Amacom, 020 8993 7373.**



# Pocket Canon

Canon's Digital IXUS V camera is the world's smallest optical-zoom digital camera at just 87-x-27-x-56.9mm (approx 3-x-1-x-2.25-inches), according to the company.

It offers a 2x-optical zoom lens and a 2.11 megapixel CCD (charge-coupled device). It can capture 30-second bursts of sound and video, and has built-in lighting compensation abilities. This £339 camera is equipped with a Type-1 CompactFlash card slot. It ships with ArcSoft Photo Impression v3.0 for the Mac. **Canon, 0800 616 417**





As Macworld Expo looms, it's a case of 'iMacs are dead. Long live iMacs'.



## Flat-pack Mac

It's Macworld Expo time again, and the rumour mill is beginning to turn at breakneck speed. The hottest pre-New York whisper is that the iMac in its current incarnation is doomed. As usual, the official word from Apple is that it has no word to give on unannounced products. Even if Apple doesn't axe all current iMacs at New York Expo, I'll eat my copy of *iMac for Dummies* if it doesn't do so soon after.

So what can we expect from Apple's next-generation of iMacs? All that's likely to survive will be the iMac name and famed consumer friendliness and beauty – even if many dissenters will point to the migraine-inducing Flower Power or Blue Dalmatian iMacs.

The key to the next-generation iMacs will be their LCD screens. The current CRT (cathode ray tube) screens are bulky, hot and power-hungry by comparison. Apple has already scrapped its stand-alone CRT-monitor range, so LCD is clearly its future. Other manufacturers may have dabbled with expensive LCD-based all-in-one machines, but you can bet your bottom dollar that Apple will be the one to make it a commercial reality.

The company has a glorious history of introducing its users to both technology and computing philosophies while the rest of world wasn't looking. Everyone else is left to cough nervously and follow Apple's lead – sometimes years later. USB is a case in point. This technology was waiting for years for somebody to use it, as PC manufacturers agonized over being the first to take the plunge. It was only when Apple boldly replaced ADB with USB in the first iMacs that they took notice. That is why so many beige PCs are still hooked to iMac-flavoured USB peripherals. The same applies to mice, CD drives, networking – even colour management. Where Apple leads, others follow.

Also, ditching CRT for LCD gives Apple flexibility on screens sizes. The entry-level size will likely be a 15.1 inches, as with the £449 Studio Display. A number of 15.1-inch displays are already as cheap as £350, and with Apple shifting them in the hundreds of thousands, this price would come down still further. Another bonus with LCD is it gives a bigger screen area, so even a 15.1 inch LCD is an improvement on current iMacs' 13.8-inches.

Far more mouth watering to many would be a wide-screen 17.1-inch LCD iMac. It is a size of screen that has been around for a few years, so shouldn't be too expensive. This would be great for desktop hungry applications, as well as for watching DVD movies. The only downside may be that for a time, prices will be prohibitive. And although it may sound like a

contradiction in terms, a pro-iMac may not be out of the question. Effectively, this would be replace the Cube, whose demise is more of a badly kept secret than a pre-Expo rumour. Although doomed, the Cube's legacy is likely to live on in the new iMacs.

Having a flat screen is only half the battle for creating a compact iMac. Apple did a great job of squeezing everything into an eight-inch box – so how tough can it be to flatten the iMac's workings and place them on the back of an LCD? The downside of this is that accessing the guts of the machine for upgrading would be difficult. In light of this, I'd like to see a door along the lines of the one on the Power Mac G4. This would make upgrading and repairs even easier than they are with the current iMacs.

The Cube's top-loading CD drive is another cross-fertilization possibility for Apple with its new iMacs. It would allow a CD drive that doesn't add to the depth of the machine. On offer could be versions bundled with various combinations of CD-RW-DVD-RAM-ROM etc.

The reason the Cube was so small was its external power-supply – and expect the same with the LCD iMacs. Many people did bleat about the Cube's brick-sized power supply, but at least it gave them something to warm their feet during long winter nights.

Colour will inevitably be another key issue. Although Apple successfully moved us away from beige, the iMac candy colours are now wearing thin. The iBook's milky gloss has been a hit, so expect white to become the new Graphite.

Supplying speakers will be harman kardon, the company that gave us the iSub. If we're lucky, Apple may even bundle with its new iMacs a reworked version of the funky SoundSticks. Whether these speakers will be built-in or stand-alone is difficult to say. It will come down to weighing the benefits of an all-in-one design against the size reduction made possible by having the speakers separate.

Cramming all this stuff into a small, sleek thing of beauty would challenge even the world's best industrial designers. Luckily Apple has exactly that in its Cupertino HQ – in the shape of its Industrial Design team, headed by Jonathon Ive. Year after year, it has been able to surprise the public and industry alike with its startling designs – so expect to be surprised this year, too. Let's just hope there are no nasty surprises – such as the Key Lime iBook.

Roll on Macworld New York – and keep your eyes glued to [www.macworld.co.uk](http://www.macworld.co.uk) for the news as it happens. **MW**

**“Apple has a glorious history of introducing users to both technology and computing philosophies while the rest of world isn't looking”**

The digital-media revolution means  
nothing if the content is ignored



## Revolting techs

In his essay on Civil Disobedience, the American philosopher Henry Thoreau states that all men recognize the right of revolution... that is, the right to refuse allegiance to and to resist the government when its tyranny is unendurable.

The problem is, most people think revolution is a good thing if it happened in the dim and distant past... and, preferably, somewhere else. If anyone starts to consider it a serious contemporary option for change, a lot of people get nervous. And when those people are politicians, global corporations or over-zealous police automatons, a few more civil liberties go down the toilet and the streets get ugly. Watching the recent anti-globalization protests in Sweden where two demonstrators were shot by police "in self defence", I was reminded of another incident one afternoon in May of 1970 when a column of US National Guardsmen shot and killed four unarmed students and seriously wounded several others at Kent State University. They weren't even dangerous revolutionaries. They were simply trying to get to class – some even had bullet holes in their books.

Apart from knowing several people associated with that incident, I personally experienced the threat of being shot by National Guardsmen just a few weeks earlier when, after one of the usual anti-war demonstrations, we were confronted by troops ordering us back into a housing block. With the usual stupid bravado, a number of us started shouting back some nonsense about jurisdiction and that troops had no right to be there. We were really outraged when they marched in formation, knelt, and levelled their rifles at us. At that point in time, it was all just guerrilla theatre and being the good ole US of A, I started shouting to the others to phone the owners to let them know what was happening, ring the Civil Liberties Union, and not to worry, they wouldn't really shoot unarmed students. After a bit more shouting and a fairly tense few minutes, the troops lowered their rifles and marched out. We smugly thought we'd won that one. But a few weeks later, the incident at Kent State made us "Think different".

I suppose the other news item that reminded me of all that was a recent puff piece about the Carl E Hirsch Media Lab at none other than Kent State University. According to the article, an impressive combination of Power Macs, PowerBooks, digital cameras, giant plasma screen, and high-speed wireless networking is now providing all of the tools young journalists, videographers and producers at

Kent State need to cultivate skills for "a new era of electronic communications". So why, after Apple's dismal performance in education over the past few years, does the Mac figure so prominently at the state-of-the-art Carl E Hirsch Media Lab at Kent State University?

Well, according to different-thinking sources at Kent State, in today's weirdly wired world, journalists have to be able to "do it all". Shoot video in the morning, edit the footage in Final Cut Pro, and post the desktop movie on the school's e-newspaper in the afternoon. Rumour has it that they even have to be proficient with the written word, although little was said about the vaguely mythological journalistic virtues of accuracy, truth, content, integrity, etc. In short, they have to be comfortable with all forms of digital media... which interestingly enough, is why the Hirsch Lab relies on the Mac – the revolutionary hub around which all digital media... well, revolves. According to the manager of student media Jeff Fruit, convergence is where everyone wants to go.

According to the director of the Institute for Cyber Information at Kent State, the Hirsch Media Lab is also being used to explore ways of building electronic editions of newspapers that blend traditional print with the hypermedia technologies used for Web sites. The objective seems to be the eventual amalgamation of vaguely quantified multimedia content and transactional features "that add value without adding complexity for the user"... whatever that means. The director claims that they're looking at how to bring video into electronic documents in a way that combines the "best of print with the best of video and the Web". Not the easiest things to find – unless best is a relative concept.

Just think, if they'd had all this stuff 20-odd years ago, the QuickTime additive in Kent State's e-newspaper, would have let us view video clips in the same way we read articles. We'd have been able to freeze a video frame of the student shootings at any point, play a segment again, slow it down or speed it up. The question is: does all this "revolutionary" technology actually improve the quality or impact of the news, or does it simply encourage a shallow, disconnected voyeurism that both dumbs down and numbs down our take on the myriad of horrors and injustices that surround us on a daily basis? Now that the media really is the message, does anyone care, or even understand, what that message is?

MW

**"The Lab is exploring ways of building electronic editions of newspapers that blend traditional print with technologies used for Web sites."**





## Macworld Rating

★★★★/9.0-10.0 = OUTSTANDING

★★★/7.0-8.9 = VERY GOOD

★★★/5.0-6.9 = GOOD

★/3.0-4.9 = FLAWED

★/0-2.9 = UNACCEPTABLE



Modelling, rendering and animation tool

## Cinema4D XL 7

Publisher: Maxon [www.maxon.net](http://www.maxon.net)

Distributor: HiSoft (01525 718 181)

Pros: Structured, logical modeller; high-quality renderer; Mac OS X compatibility.

Cons: Lack of third-party support; for example, vector rendering.

Minimum specs: System 7.6.1, 64MB RAM

Price: £1,188; upgrade from version 6, £297 (both prices exclude VAT).

Star Rating: ★★★★★/9.2

Maxon's Cinema4D XL is a 3D modelling, animation and rendering tool with a devoted following – it has a loyal user base in what is a very crowded market. Cinema4D is a genuine cross-platform tool, and, unlike many other 3D applications, it's not just a badly implemented port from a PC.

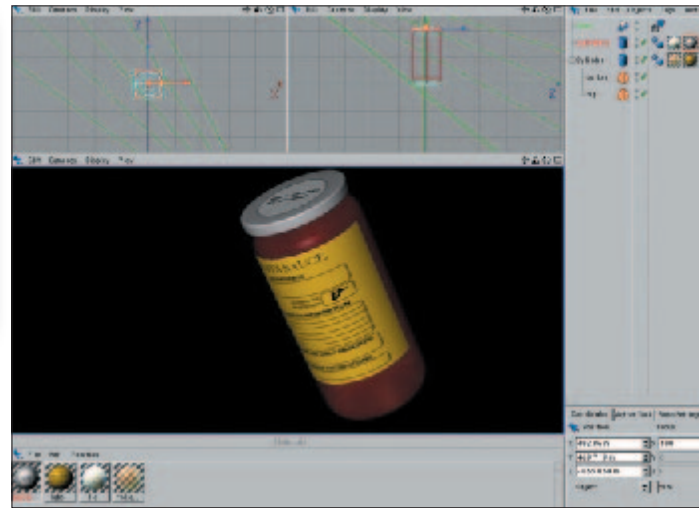
Maxon has upgraded Cinema4D aggressively over the past two years – this is the fourth release in that period – and always released on both Mac and PC simultaneously. The program is beginning to find friends in high-places, and has been used on films such as *Gladiator*.

### Deformed

One of the reasons Cinema4D has won such a loyal following is that it's a logical, structured tool, and relatively quick to learn. Objects are added as either primitives, or created by taking paths and extruding them or sweeping them. Once you've created a basic form, you can then apply deformations and other effects. These are recorded as individual actions in a clear hierarchy, which makes it easy to undo changes and step back simply by deleting the action. Similarly, textures and image mapping can be applied and removed at will, making it easy to experiment without worrying that you may ruin your masterpiece.

Cinema4D even has its own script-based programming language, COFFEE, which you can use to save your procedures and write your own plug-ins. It's fully object oriented, and uses a similar syntax to C++ or JAVA – so it's not for the fainthearted, but for the hardcore users it extends the programs functionality. There is a lack of third-party plug-ins at the moment, but this is slowly being addressed.

Taking simple forms and then applying a logical sequence of adjustments, and grouping objects together is the key to 3D modelling. The workspace only shows one view by default, but this is quite easy to manipulate and navigate. You can switch



### Clean look

The interface for Cinema4D is clean and logical – the hierarchical object window shows all the objects, effects and materials.

to two, three, or four views if required.

Cinema4D's renderers – known as shaders – improves on the much-admired one in previous versions. A new feature is the radiosity render, a processor-intensive technique that actually calculates light reflected between objects. It produces stunning results that have a warmth that straightforward raytraced scenes often lack.

Another great new rendering feature is multipass rendering, where all the various components of a render – such as reflections – can be written as separate layers in file format that supports them, for example as a Photoshop .psd.

For greater rendering flexibility, version 7 now incorporates the Smells Like Almonds 2.5 collection of shaders, which allows you to create stylized render effects – such as X-ray. Very impressive.

### Particle explosion

The particle and metaball effects in Cinema4D have always been one of its strong points, and this is further improved with a new Explosion tool. It allows you to explode objects into a number of 3D parts – rather than into 2D polygons – and set parameters to determine the strength, direction and other properties of the blast.

Given that the 3D market is a crowded one, it's important that your chosen 3D tool can work with other file formats. Cinema4D can export 3D Studio Max, Wavefront and a number of generic formats, such as VRML, DXF and QuickDraw 3D. Support for Macromedia's Shockwave3D format has been announced, but has not yet been

released. I would also like to see a vector-based export such as EPS or Flash SWF, but I guess you can't have everything.

The package also comes with a three-client licence for Cinema4D NET, the network rendering tool, so you can set-up a render farm – essential if you are doing high-res, broadcast-quality animations. It's easy to set-up over a TCP/IP network and it can be controlled and administered through a Web browser. Maxon has thought of everything.

### Macworld's buying advice

Cinema4D XL seems to have it all. It has the features and functions of competing products that cost five times the price. Its cross-platform compatibility is a breath of fresh air for Mac users accustomed to watching the skies for a half-baked port. The new release cements Cinema4D XL's position as the one to watch in the 3D world.

Martin Gittins



### Lightning quick

Here's an example of a Radiosity render, showing how the light from the side objects is reflected onto the various other objects in the scene. This rendered in 12 minutes on my G3 – pretty fast for such a complex render.



3D-landscape modeller

## Bryce 5

Publisher: Corel (0800 581 028)

[www.corel.co.uk](http://www.corel.co.uk)

Pros: Easy to use; more control over lighting; tree creator; Mac OS X compatible.

Cons: The rendering can be painfully slow on complex scenes.

Min specs: Mac OS 8.6; 64MB RAM; OS X requires 128MB RAM.

Price: £195; upgrade, £110 (both prices exclude VAT).

Star Rating: ★★★★★/8.6

Ever since its first incarnation, Bryce has been a niche 3D-application. It has concentrated on landscape creation, rather than more normal modelling animation. While Bryce is the leader in this field of one, it's still improving.

Bryce 5 is the first big release since it was purchased by Corel, and it shows that Corel is committed to the product.

There are a few new features that improve ease of use and the capabilities of the application, but what many people are excited about is the Mac OS X compatibility. Bryce 5 will run on any Mac running OS 8.6 through to OS X.

### Can't see the woods

New to the user interface is the Tree Lab, which allows users to specify one of 60 different types of tree to add to a scene. You can use the pre-sets, or manipulate the settings to make your own trees. Almost every tree you can think of is there, from apple to willow. One small niggle is that while you can mix and match trees and leaves – a dogwood tree with monkey puzzle leaves, for instance – there's no way of simply selecting a pre-made tree. Also, trees are created singularly – it would be useful to be able to create smaller forests of trees. Alias|Wavefront's Maya can paint 3D flora onto landscapes, but the price tag of £6,360 means that it isn't worth buying for this feature alone.

Metaballs are another new addition to Bryce. This primitive-object type can be manipulated and moulded to achieve all kinds of organic shapes. It isn't a fully fledged modeller, but it does add to the capabilities of Bryce.

Version 5's Lighting Lab offers much more control over lighting than before. You can now add as many lights as you like. Different options – such as intensity and shadow ambience – can be set for each light. You can also use colour or virtual gels on the lights.



The difference between the OS X and the pre-OS X versions is negligible, as Bryce takes over the whole screen with its own interface. Both completely ignore the normal Mac interface, and force you to learn a new one. This is a throwback to the original developer of the Bryce, Kai Krause. For those not familiar with Kai's work, he has made some of the most innovative interfaces, for products such as Kai's Power Tools, Kai's Power Goo and Photo Soap.

The thing about these innovative interfaces is that they take a while to learn. Bryce looks lovely, and it's pretty much the same as before, but new users may be a little irritated at its less than intuitive design. However, long-time Bryce users will be reassured to know that things haven't changed.

Render settings have always been a bit of a dark art, especially to the uninitiated. With all the new gadgets in Bryce, the render engine itself remains unchanged. This is a shame, as the G4's Velocity Engine (aka Altivec) is capable of achieving much-accelerated render times in applications that are optimized for it.

Although the render engine is no faster than in previous versions, there are additional features such as depth of field settings that you can access. Unfortunately, the additional render options can only slow proceedings.

A new way to speed rendering is over a network. This allows spare processing power on other machines to be used.

With all the odd features of Bryce, it's still very easy to use. It has been designed to be accessible to people

without a great deal of 3D experience. However, it does offer high-end features, so if you are a 3D expert it's still a useful tool. One thing I always have trouble figuring out is exactly who the target audience is. There is certainly a market for landscaping for architectural design, and of course it's a tool capable of creating pictures worthy in their own right. It's a bit like being a landscape painter, but without the inconvenience of heading to the great outdoors. Bryce is also a great tool for illustrators.

### Macworld's buying advice

For £195, it's relatively cheap for the pro designer to get this tool. If you're an amateur wanting to try your hand at being the next Roger Dean (you know, those 70's album covers and student wall hangings), then the price is a little high. David Fanning

### Topographic Oceans

Ideal for illustrating 70s' concept albums, Bryce brings out the fantasy artist in anybody.

### Lab tests

The Materials Lab lets you cook-up all manner of textures. You can make anything from azure to zebra stripes.







## Removable-drive system

## Peerless

**Manufacturer:** Iomega (020 7309 1026)

[www.iomega.com/europe](http://www.iomega.com/europe)

**Pros:** LCD display shows disk and transfer info; design matches pro Macs; base station's interface module will soon be available for USB, FireWire, SCSI and USB 2.0 connections.

**Cons:** USB too slow; media same price as FireWire hard drives that don't require base station; interface module not yet available separately from base station in Europe.

**Min specs:** Mac OS 8.6; USB.

**Price:** Base station bundled with 20GB disk, £340; stand-alone base station, £230; 10GB disk, £135; 20GB disk, £170. (All prices exclude VAT.)

**Star Rating:** ★★/4.8

The history of removable media is full of funny names, odd-shaped disks, and expensive obsolescence.

Bernoulli, Floppy, Floptical, Ricoh, SyQuest, SparQ, SyJet, Orb, Zip, Jaz... some were legends of their day, some fooled only a few, and some still survive.

In the days when a 100MB internal hard-drive was something to whistle at, removable 44MB SyQuest cartridges (the first "classic" removable disk) offered us the chance to transport files without having to lug our Ilci over to the repro bureau. It was that, or format hundreds of floppies a week.

Now you can buy 9GB DVD-RAM disks for under £40, and tiny 20GB FireWire hard drives for as little as £199. At *Macworld*, we stopped using Jaz disks for sending files to our repro house when the cost of blank CDs dropped below 50p.

## Up next

So, with cheapo blank CDs and giant DVDs, what's the future for Iomega's Zip and Jaz? While assuring us that these two formats have massive installed bases, Iomega has just released a totally new removable format, with obligatory funny name and weird-shaped disk.

The Peerless drive incorporates IBM's rugged Travelstar hard-disk technology. By separating the electronics from the mechanism, Iomega has ensured that the hard-disk's electronics don't have to be built into every disk – which should save money and weight.

The £230 base station that the disks slot into is connected to the Mac or Windows PC via SCSI, USB or FireWire. USB is available now, but FireWire bases should be shipping by August. Iomega expects SCSI bases to ship in September, with USB 2.0 by the end of the year. A Mac OS X software patch to the

IomegaWare drivers is expected in September.

Disks – about the size of a Palm PDA – are not tied to any one interface, and can therefore be swapped between USB, FireWire and other interfaces. 10GB disks cost £135, and 20GB are priced at £170 each. The disk is fully sealed, eliminating the risk of dust contamination.

This isn't an alternative to Zip, which maxes out at 250MB. But Peerless offers up to ten times the disk-size of Jaz – so if you regularly have to resort to two or more Jaz disks per transport, switching to the new format could be a wise move. 20GB of Jaz disks costs £600, for crying out loud. But, as with all new removable formats, you have to make sure that the person you're sending the disks to also has the base station. And it will take a while for Peerless to be as ubiquitous as Jaz – now, like SyQuest and Zip before it, a bureau standard.

Another barrier in Peerless' way is the price. £199 for 20GB is certainly not expensive, but remember that you must buy at least one base station as well. One base station bundled with a 20GB disk costs £340. If you're using Peerless to transport data between home and the office, for example, your minimum outlay (two bases and one disk) is £570.

With FireWire hard drives – such as Mac & More's FireLight, which is also based on the Travelstar – costing £199 for 20GB, Peerless just doesn't compete. Unless Iomega drops the price by some margin, Peerless can't compete against the likes of the FireLight, which requires only that the sender and receiver have a FireWire connection and cable (£8).

Peerless could be an option for those Macintosh users who don't have a FireWire connection, but the USB model is too slow for words. (OK, I'm exaggerating. The words are: it took 25 minutes to transfer 1GB of data from my hard drive to the Peerless disk via USB.)

Iomega could supply us with only USB bases for testing, but claims that the FireWire model allows data-transfer rates of up to 15MB per second. USB-only people should buy a FireWire card if they can install one in their Mac, or stick to using CDs – which have about the same maximum speed (4x) as Peerless USB – if their folder sizes don't often go above 2GB. If you handle 5-10GB files often, get a FireWire connection before you get Peerless.

As discussed above, FireWire users should stick with cheaper hard drives until Iomega drops the price of the disks. Separating the electronics from the drive mechanism is meant to mean lower costs per gigabyte, but there's presently no sign of any savings with Peerless.



Peerless could have a place where several different interfaces co-exist. Transferring very large chunks of data between SCSI, USB-only, FireWire and, later, USB 2.0 systems can be a real headache if you're not on a network. As the disks fit in any Peerless base, there's no trouble transferring data from your system via FireWire and passing the disk to someone who's got only SCSI.

Iomega also has plans to get Peerless into in-car entertainment systems for music and back-of-the-seat movies. You could fit about 350 albums on one 20GB disk, which should give most people enough choice for even a trip on the M25. The company is also talking to Satellite TV set-top box manufacturers.

## Macworld's buying advice

At today's pricing, Peerless provides a solution for multi-connection data transfers only. The USB model is too slow, and people with FireWire can save having to buy the £230 base station by purchasing today's slim, inexpensive FireWire hard drives instead. We'll speed-test the Peerless FireWire when we get one, but the real stumbling block is price per gigabyte – and Iomega needs to slash its prices to ribbons before Peerless can truly live up to its name.

Simon Jary

## Interface for new media

Iomega's Peerless drive really looks the part next to your Graphite Power Mac G4 or titanium PowerBook G4. The base station's neat LCD display shows you the current transfer rate (unfortunately not very fast with the USB model), as well as an indication of the disk's spare capacity.

First you buy a base station and disk. Then you buy another base station for the place you're taking/sending your disks to. In the US, Iomega allows you to buy the interface module (the black bottom part with the LCD) separately from the whole base station, which allows for greater flexibility in a mixed-interface (USB, SCSI, FireWire) environment. This cheaper arrangement is not yet available in Europe.





CAD modeller and renderer

## VectorWorks 9

**Publisher:** Nemetschek [www.nemetschek.net](http://www.nemetschek.net)

**Distributor:** Gomark (020 7610 8686)

**Pros:** Leading CAD tool for Mac; fully scriptable.

**Cons:** No inbuilt shader or material editor.

**Price:** £629; upgrade from version 8, £174; upgrade from version 7 or lower, £212; RenderWorks, £204 (all prices exclude VAT).

**Min specs:** 64MB RAM; Mac OS 8.6.

**Star Rating:** ★★★★★/8.8



Try VectorWorks for yourself – the demo is on this month's CD.



### Nice tools

Interface and navigation amendments make tools easy to use and ultimately more productive. These include quick pan-&-zoom using the Space bar, and better undo capabilities that don't reset the tool you were using.

**V**ectorWorks has been through some major changes over the past few years. Formerly known as MiniCAD (the previous name was thought to be rather belittling), it is now published by Nemetschek after it acquired the previous publishers Diehl Graphsoft. Since the acquisition, the application has been through a major revamp to develop what Nemetschek claims is a faster, more powerful and more accurate modeller and renderer.

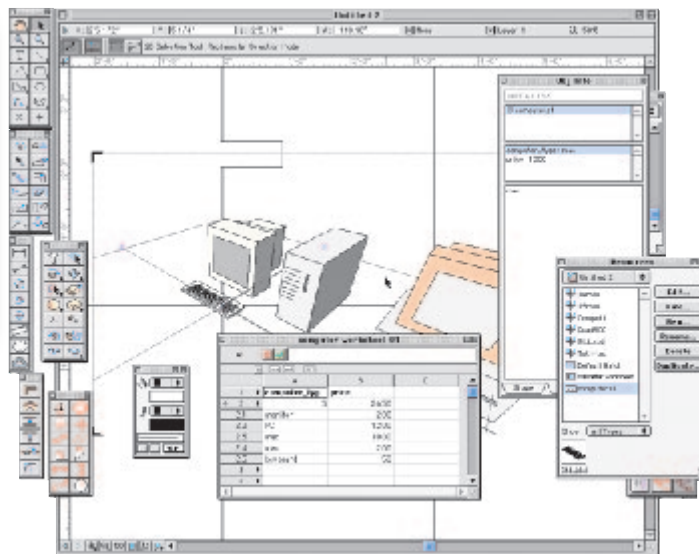
A cross-platform application, VectorWorks punches above its weight on the PC platform against the likes of heavyweights AutoCAD and Microstation. On the Macintosh, it holds the belt, with no other pro-level application packing the same punch for the price. The nearest contender is Graphisoft's ArchiCAD, which weighs in at around £3,000. It's the winning price-performance combination that has made VectorWorks the undisputed champion on the Mac, but it's good to see that Nemetschek hasn't been complacent, and in round 9, has come out fighting fit and ready to rumble.

### Multi-dimensional

VectorWorks is intended to be used as a precise object-oriented design tool, and can work in both 2D and 3D drafting modes, and switch between the two. Thus, it is not a 2D-illustration program like FreeHand, nor is a dedicated 3D-modelling program like Cinema4D.

An office fit-out can contain not just the plans for the builders, but also the presentation drawings for the client, and if something is changed, be automatically updated across all views. Another layer of the document could contain electrical layout or network cabling to be shown to the relevant engineers. VectorWorks can also operate with what is called Workgroup referencing, so that different specializations can work on separate layers of the same document. The concept of a live network document is one of the Holy Grails of CAD, and VectorWorks' integrated environment brings it closer than most. One document, many uses, is the mantra of VectorWorks.

Nemetschek have really boosted the



### Data spread

VectorWorks Objects' properties can be used to create a spreadsheet of components and prices.

3D-modelling tools with full NURBS (Non-uniform Rational B-Splines) and Polygons support, allowing you to create much more complex and organic 3D objects. VectorWorks supports operations such as sweeping and lathing to create complex, organic 3D forms. The built-in renderer is limited, and features OpenGL support, but the plug-in RenderWorks module, available separately, offers advanced shading and ray-tracing. The animation facility is similarly rather lacklustre, with little control over the camera movement or focus.

One of the first things existing users of VectorWorks will notice is that it is now dongle-protected, either with a USB or ADB connector. For USB users this means that you lose one of your USB ports. The debate over the pros and cons of dongles has gone on for a long time, and it's a brave step by Nemetschek. Without a dongle, VectorWorks runs in a demo mode, and you can't export or save.

Besides this obvious change, the new features of version 9 are generally rather subtle, and to the benefit of existing users rather than the wooing of new users. One of the most significant new features, native support for AutoCAD 2000 DWG files, will be of most interest to PC – users, although Mac users will be happy to know that they can transfer files to their PC-using colleagues with ease. Under the bonnet, VectorWorks' new 64-bit co-ordinate system increases the accuracy, even when changing scales and units.

Text is another area where the new features are a boon. A decent spell checker – which works across the whole document, including database records –

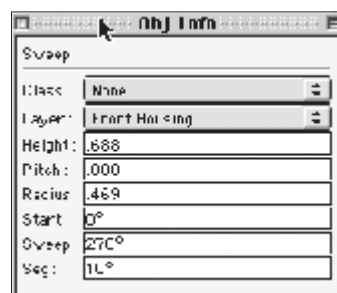
and a find-&-replace tool have been added. Dimensions can now be associated with an object, so that if the object is resized its dimensions are amended accordingly.

Printing has been improved with the ability to Print the current View, as well as a quick and easy way to set the printable area.

### Macworld's buying advice

The enhancements in VectorWorks 9 make it a worthwhile upgrade for core users, but there is nothing new outstanding on the surface to tempt away users from ArchiCAD or across from AutoCAD on the PC. But, VectorWorks remains an exceptionally high-quality program at an affordable price – a knockout.

**Martin Gittins**



### Objectified

VectorWorks Objects can contain much more information than their representations on screen – for example a door object can contain symbols and representation for plans and perspectives, and can also be imbued with properties such as manufacturers, model, even colour, all of which can be stored inside the database component of VectorWorks.



Pro Tools Plug-ins

## Reverb 1

**Publisher:** Digidesign  
(01753 653 322)  
[www.digidesign.com](http://www.digidesign.com)

**Pros:** Provides high-quality reverb effects.

**Cons:** Needs a better selection of presets.

**Min specs:** TDM versions require a Pro Tools MIX or Pro Tools 24 TDM system with Mac OS 8.6 or greater; Audio Suite and RTAS versions also run on Pro Tools LE systems.

**Price:** £749 (excluding VAT)

**Star Rating:** ★★★★★/8.2

## Orange Vocoder

**Publisher:** Digidesign

**Pros:** Creates classic vocoder effects.

**Cons:** A little fiddly to set up.

**Min specs:** See Reverb

**Price:** £189 (excluding VAT)

**Star Rating:** ★★★★★/7.1

## Bruno/Reso

**Publisher:** Digidesign

**Pros:** Adds many creative options for sound processing.

**Cons:** Steep learning curve.

**Min specs:** See Reverb

**Price:** £299 (excluding VAT)

**Star Rating:** ★★★★★/7.4

## Maxim

**Publisher:** Digidesign

**Pros:** Prevents clipping and preserves sound quality.

**Cons:** Documentation needs more examples of real applications.

**Min specs:** See Reverb

**Price:** £339 (excluding VAT)

**Star Rating:** ★★★★★/6.2

## Sound Replacer

**Publisher:** Digidesign

**Pros:** Takes the sweat out of replacing samples in a Pro Tools session.

**Cons:** None.

**Min specs:** See Reverb

**Price:** £299 (excluding VAT)

**Star Rating:** ★★★★★/9.0

It seems like everyone and his dog is releasing plug-ins for Pro Tools these days, including Digidesign itself. Here is a selection of the latest releases that let you create lots of useful special effects.

**Reverb 1** is Digidesign's latest offering for Pro Tools TDM users. Plenty of visual feedback is provided, with individual graph displays for Reverb EQ and Colour, and a third display showing the Reverb Contour. The graphs can be edited directly within the displays, and you can use the EQ graph to control the three-band equalizer to shape the tonal spectrum of your reverb. The Reverb Colour graph lets you set decay times for the different frequency bands for additional tonal shaping.

The Reverb Contour graph displays the envelope of the reverb, showing early reflections and the reverb tail in different colours. Dynamics and Chorus controls let you refine the reverb decay and effects.

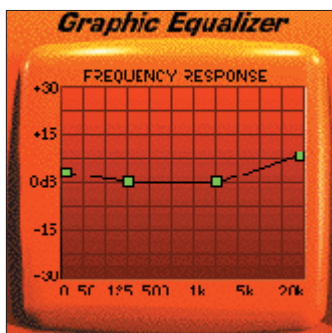
Reverb One compares favourably with the Lexiverb plug-in – although LexiVerb has a wider selection of presets – and blows the humble D-Verb right out of the water.

With Reverb 1, all the presets are of high-quality and instantly useable – with everything from large arenas and cathedrals to halls, theatres and small wood rooms, plus a fair selection of special effects.

The **Orange Vocoder** is a digital simulation of a high-quality 24-band analogue vocoder. Vocoderes were originally developed for speech encryption. However, they are now used mostly to create musical effects where the characteristics of one input signal are imposed onto those of another.

With the Orange Vocoder plug-in for Pro Tools, you can use any input or audio track as the modulator signal and use any input, audio track – or the built-in 8-voice analogue synthesizer – as the carrier signal. There are two banks of Band Pass filters that you can apply to the Modulator and Carrier signals. Using these, the frequency spectrum of the input signals is divided into 24 narrow bands of frequencies. The amplitude settings of the filters in the Modulator filter bank are then used to control the amplitude settings of the filters in the Carrier filter bank – thus, the spectral shape of the Modulator is superimposed onto the spectral shape of the Carrier.

**Bruno** and **Reso** are a pair of real-time TDM plug-ins that process audio using a sound generation technique known as cross-synthesis. Cross-synthesis generates complex sound textures by using an audio track as a tone source, then applying a variety of synthesizer-type effects to it.



### Plugged in

*Orange Vocoder (top, left) creates a wide range of beautiful-sounding results, while Reverb 1 (bottom, right) is one of the best choices available in the Digidesign range. Morphing gun shots, or adding a Doppler effect takes seconds in Sound Replacer (bottom, right), and Reso (top, left) toggles its harmonics back and forth using the dynamics of another signal.*

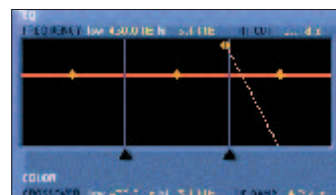
Bruno uses time-slicing for tone generation, extracting timbres from the audio track during playback and cross-fading them together at a user-selectable rate. This crossfading creates a rhythmic pulse as the timbre of the sound changes.

### In harmony

Reso uses a resonator, which adds harmonic overtones to the source audio through a short signal-delay line with a feedback loop. It also features velocity-sensitive resonance, damping, gain, and detuning, and allows harmonic switching using envelope triggering or a MIDI beat-clock. You can use side-chain processing to control the rate at which Bruno performs sample switching.

**Maxim** provides peak limiting and sound maximizing functions in TDM, RTAS, and AudioSuite formats. You can use this on individual tracks within a mix, and it's particularly useful when applied to stereo mixes for mastering.

The user can set an absolute ceiling that the dynamic range cannot exceed using the peak limiter, or set a threshold for the limiter beyond which gain reduction is applied according to the settings chosen. The look-ahead design allows Maxim to anticipate signal peaks and respond instantaneously, thus preserving the attack transients as transparently as possible while preventing clipping of the peaks. If you apply limiting to your final mixes to remove any occasional large peaks in the music, then you are free to raise the overall level of your mix to much higher levels without risk of clipping. Limiting can also be used



with individual instruments to smooth out peaks or to change the sound of the instruments radically.

A typical task in both music and post-production is replacing a particular drum sound or sound effect. To go to each instance of a sound in the Edit window and manually replace it can take ages. Now there is a solution. **Sound Replacer** matches the original timing and dynamics of the source audio, while providing three separate amplitude zones per audio event.

This allows you to trigger different replacement samples according to performance dynamics. Each replacement sample is assigned its own adjustable amplitude zone. Variations in amplitude within the performance determine which sample is triggered at a specific time. For example, you could assign a soft snare hit to a low trigger threshold, a standard snare to a medium trigger threshold, and a rim shot snare to trigger only at the highest threshold. Sound Replacer is also a powerful tool for sound design and post-production.

### Macworld's buying advice

Most productions use reverb, and Reverb 1 will provide all the basics and most of the special effects you're likely to need. If you are making dance music, then Sound Replacer is an essential buy, as is Bruno/Reso, which will let you create many of today's popular effects. The Orange Vocoder is not an essential purchase, but is good to have around. Maxim works fine, but, again, is not something you will use on every session.

**Mike Collins**





## Analogue-to-DV converters

### Hollywood DV-Bridge

**Manufacturer:** Dazzle Multimedia  
www.dazzle.com

**Distributor:** Tiny Accessories  
(01732 470 831)

**Pros:** Remote control of Sony Handycams.

**Cons:** Structurally unstable; requires external power supply.

**Min specs:** FireWire.

**Price:** £299 (excluding VAT)

**Star Rating:** ★★★★★/7.6

### Formac Studio

**Manufacturer:** Formac (020 8533 4040)  
www.formac.co.uk

**Pros:** Powered by FireWire bus; extra FireWire port; sleek design.

**Cons:** Pricier than the others.

**Min specs:** FireWire.

**Price:** £319 (excluding VAT)

**Star Rating:** ★★★★★/8.5

### Director's Cut

**Manufacturer:** Miglia www.miglia.com

**Distributor:** Channel Dynamics

(0870 6070 540)

**Pros:** Powered by FireWire bus; extra video output for monitor; dedicated headphone jack.

**Cons:** Requires manual switching; less aesthetically pleasing than the others.

**Min specs:** FireWire.

**Price:** £299 (excluding VAT)

**Star Rating:** ★★★★★/7.9

Perhaps you're intrigued by Apple's new focus on digital video, but own an analogue camcorder or have a pile of home movies on VHS tape. In either case, you'll need a way to get that analogue video into your Mac digitally. The best way to do that is with a FireWire analogue-to-DV converter, which can send the audio and video from your Mac right back out to your TV screen.

We looked at three analogue-to-DV converters that offered similar features: the Dazzle Multimedia Hollywood DV-Bridge, the Formac Studio, and the Miglia Director's Cut. All the products performed



as advertised, but the Formac Studio stood out as the most Mac-compatible and innovative of the bunch.

When you play analogue audio and video, a converter box digitizes the media and converts it into the same DV format used by digital camcorders, which is then sent to your Mac via FireWire.

Hooking up a DV converter is simple: just plug it into a six-pin FireWire port on your computer and connect it to your video source, and it's ready to go. The Hollywood DV-Bridge and Formac Studio converters come with the necessary FireWire cables.

### Knowing iMovie

Once the converter is connected to the computer and the camcorder, you can begin capturing or exporting video. In tests with a 500MHz G4 Power Mac and an iMac DV, we were able to capture and play back video using each of these converters from within Apple iMovie 2.0.3 (including the Mac OS X version), Adobe Premiere 6, and Apple Final Cut Pro 2. We didn't notice any differences in image quality among the four.

In our tests, iMovie immediately recognized all the converters with no problem. For Premiere, we had to select each device specifically from a control menu before the program could communicate with the converter. The Formac Studio and the Hollywood DV-Bridge detect whether you're capturing or outputting a signal, and they have LED indicators that show the direction of transfer. Both also have buttons for switching sources, in case automatic switching doesn't kick in. With the Director's Cut, you must switch sources manually.

In the industrial-design department, the Director's Cut looks as though it belongs in a TV studio: it's housed in a sturdy, utilitarian metal box that only an engineer could love. At the opposite end of the aesthetic spectrum is the Formac Studio, a curved silver box that would look more at home in an ad agency (Formac also sells a clear model). The lithe form and vertical orientation of the Hollywood DV-Bridge make the device so unstable that even the strain from the connecting cables can pull it over.

S-Video and AV jacks are standard on all the

converters, but the Director's Cut carries an extra S-Video-out port for monitoring the signal being sent to the VCR – a handy feature you'd normally find only in professional



studio equipment. It also has a quarter-inch headphone jack with a level knob. The Formac Studio includes two additional coaxial inputs, for cable TV and antennae.

The Hollywood DV-Bridge uses an external power supply; the Director's Cut and Formac Studio take a more convenient approach, drawing power from the FireWire bus. The Formac Studio also has a second FireWire port, for daisy-chaining other peripherals.

The Formac Studio offers some unique features, including a TV and radio tuner and an internal speaker. An option in the ProTV tuner software allows it to search for available TV and radio channels; you can assign names to the individual stations it finds. Unlike Formac's other TV tuner product, the ProTV PCI card, the Formac Studio doesn't support closed-captioning or let you adjust brightness and contrast.

If you own an analogue Sony Handycam, the Hollywood DV-Bridge lets you control your camcorder's playback functions from within Premiere or iMovie, making these features almost as easy to use as a digital camcorder.

### Macworld's buying advice

If, in addition to converting analogue audio and video, you want to add a TV and radio tuner to your Mac – or need an extra FireWire port – the Formac Studio is a great all-in-one choice. If you need a dedicated headphone jack or an extra video output, consider Director's Cut. If you're willing to forgo extra features, choose the Dazzle Hollywood DV-Bridge.

**Jeffy Milstead**

### Studio display

The Formac Studio offers more playback options than the Director's Cut (below, left) and Hollywood DV-Bridge (below), supporting 16:9 and 2.35:1 aspect ratios in addition to the standard 4:3. All products support PAL video format, and they also support NTSC.



### Blast off

The ProTV software that comes with the Formac Studio can capture timed snapshots to a folder – handy if you're building a webcam.



## Racing games

### WaterRace

**Publisher:** French Touch Software  
[www.french-touch.net](http://www.french-touch.net)

**Pros:** Editing tools included; varied courses and boats; realistic.

**Cons:** In-game characters are silly; occasional stability problems.

**Min specs:** G3; 6MB VRAM; 14MB RAM; 100MB of free disk-space.

**Price:** \$29

**Star Rating:** ★★☆☆/6.7

### 4x4 Evo

**Publisher:** Gathering of Developers

**Distributor:** Softline  
(01883 745 111)  
[www.softline.co.uk](http://www.softline.co.uk)

**Pros:** Stunning graphics; Internet and network play.

**Cons:** Limited driver's view; no damage modelling.

**Min specs:** Mac OS 8.6; G3; 3D graphics card with 4MB VRAM; 64MB RAM.

**Price:** £34.99 (including VAT)

**Star Rating:** ★★★★★/7.5

### Driver

**Publisher:** MacSoft

**Distributor:** Softline

**Pros:** Seventies muscle-car action; fun Film Director mode.

**Cons:** A bit unstable; problematic installer.

**Min specs:** G3; Mac OS 8.6; 64MB RAM; 250MB hard-disk space.

**Price:** £39.99 (including VAT)

**Star Rating:** ★★★★★/7.3

### Cro-Mag Rally

**Publisher:** Pangea

**Distributor:** MacGold  
(0845 2250 622)  
[www.macgold.co.uk](http://www.macgold.co.uk)

**Pros:** Gorgeous graphics; fun and varied challenges; split-screen mode.

**Cons:** No Internet play; a bit childish for some

**Min specs:** 233MHz Mac; OpenGL-compliant 3D Accelerator (will not work with old ATI Rage II accelerators); Mac OS 8.6.

**Price:** £29 (including VAT)

**Star Rating:** ★★★★★/7.1

Call me a heretic, but I have to admit that the Mac isn't my only gaming machine. It's true: I've also got a few console games attached to my TV – because many of my favourite games just haven't had good Mac equivalents. This has been particularly true of driving games, but the situation is changing. We'll take a look at what's available in the racing genre for the Mac.

If movies like *Bullitt* or *The French Connection* are your thing, then you should definitely check out *Driver*, from MacSoft. In the game, you're an undercover cop sent to bust up crime rings by becoming the person who drives the getaway car. You must fend off other cops, other crooks, loads of slow pedestrians, and city traffic.

A frustrating game to learn, *Driver* is a blast once you get the hang of it. You'll power around San Francisco, Los Angeles, Miami, and New York in muscle cars, doing bad things that'll get you in trouble unless you outrun the cops and robbers. *Driver*'s coolest feature is its Film Director mode: your inner cineast can block out shots and control the "cameras" when you replay your high-speed chases.

The game does have rough spots. It crashed my Mac once, and its installer left me with a generic application icon and a messy folder filled with configuration files.

*Driver* is a single-player game, but it offers many game types and enough challenge to keep things interesting. Some cities, for example, can't be visited until you've completed your missions elsewhere.

#### My other car is a boat

When I was a kid, I loved to play in the bathtub with plastic hydroplanes and jet boats. I suspect that the people at French Touch Software had similar experiences, because playing *WaterRace* – its debut Mac game effort – is a lot like that.

You choose from a variety of characters, pick a boat, and race through your choice of exotic locations. Your goal is to win the *WaterRace*, an international speedboat championship. Some of the



#### Water whirl

With *WaterRace*, from French Touch Software, you can challenge your mates by playing networked games over the Internet.

characters are comic to the point of silliness, with names such as MC Tiger and Rusty McCow.

French Touch Software developed *WaterRace* as a Mac application from the start. Many of the tools used to create the game are included on the *WaterRace* CD-ROM – a rare and generous gesture. You can use these tools to create your own courses, boats, and other elements.

*WaterRace* is enormous fun to play, but it can be unstable – I had to manually tweak some of the configuration settings to get them to stick. It does, however, have a great soundtrack, a decent physics model (boats slip and slide just as you would expect them to), and enough variety in boat handling and course layout to pose challenges along the way. It also supports network play, so you can round up an Internet game whenever you like.

#### Let the good times roll

If your tastes run more to mud and grit than to sand and surf, *4x4 Evo*, from Gathering of Developers, is worth

checking out. It puts you behind the wheel of a light truck or sport-utility vehicle (from a real automaker) and lets you barrel through one of more than a dozen courses – from high desert to a military air base to a junkyard.

Pangea Software scored big earlier this year when Apple chose to include *Cro-Mag Rally* on both the iMac and the G4 Cube. If you haven't bought a new system this year and are looking for a cart-style racing game, look no further.

*Cro-Mag Rally* is a good, well-rounded game. You take control of cave people as you navigate a series of racing circuits through different ages of civilization. It features a variety of cars with unique handling and performance, and power-ups.

You can play *Cro-Mag Rally* over a LAN, but not over the Internet. My favourite feature is split-screen multiplayer support. You and a friend can sit down at the same Mac, with two game controllers, and *Cro-Mag Rally* actually divides the screen between the two of you. Pangea does an awesome job on the fit and finish, and the game is stupefyingly fun.

#### Crossing the finish line

Each of these games brings something to the Mac driving-game experience: *4x4 Evo* is realistic, while *Driver*'s Film Director mode makes replays almost more fun than the action itself. And *WaterRace* is great if boats are your thing. You may also want to take *Star Wars: Episode 1 Racer* for a spin (Reviews, March 2000).

Our choices in the driving-game arena are growing, and hopefully we'll be able to keep on truckin' for years to come.

Peter Cohen



#### Racing ahead

Nothing comes close to *4x4 Evo*'s graphics or simulations when it comes to virtual driving.





## Workhorse colour-printers

## C9200

**Manufacturer:** Oki (0800 917 6015)

**Pros:** Very fast output; fast first page to print; 21ppm output.

**Cons:** Quality isn't great.

**Min specs:** Ethernet.

**Price:** £4,399 (excluding VAT)

**Star Rating:** ★★★★★/8.1

## Phaser 860 DP

**Manufacturer:** Xerox

**Pros:** Excellent quality output; fast.

**Cons:** Not as fast for first page print as the previous version.

**Min specs:** Ethernet.

**Price:** £3,372 (excluding VAT)

**Star Rating:** ★★★★★/8.2

One of the last bastions of monochrome in all our lives will be the office printer. We no longer have to look at monochrome TVs, computers with mono screens are a thing of the past, and even our home printers are colour. Here are two printers that will tempt you to ditch the mono laser-printer for good.

The two models are from Oki and Xerox and are A3 and A4 respectively – neither are strictly speaking laser printers, but do the same job none the less.

The Oki C9200 (pictured, top) is a monstrous printer, though amazingly not as big as some other A3 colour printers. It uses LED technology, which works much like laser printers. It still uses toner, but it works a little quicker than most laser-based models. This is because of its single pass design, which cuts down on moving parts and complex paper paths.

The claimed speed is 21 A4-pages-per-minute (ppm) in full colour, and that is exactly what we got in our tests. It's more than twice the speed of any previous A3 colour printer tested, and easily the fastest colour printer we've looked at. In mono, the print speeds reached 26ppm.

As important as page speeds is the

time it takes to get the first page out. The first page per print accounts for more print time than anything, because most jobs are only two or three pages long.

The Oki 9200 does well on the first page to print, getting our infamous printer killer page out in just 44 seconds. The fastest we have measured for this page is 43 seconds, so the Oki is doing pretty well on all speed scores.

Quality is a different issue though, and the LED printer isn't great. It isn't terrible, but there are definitely problems. On gradients, and even solid colours, there are both vertical and horizontal lines visible. Text is unaffected by these artefacts and colour rendition is good, but quality has been sacrificed for speed.

The other printer we looked at was the Phaser 860 DP (pictured, left), the latest in a long line of solid-ink printers from Tektronix, though now the brand is owned by Xerox.

In the past the solid-ink printers have mixed high-quality output with formidable speeds. The output of the 860 is as good as ever, and the new design uses less ink than before to cut down the waxy look from previous versions. Although having wax-based solid ink enables luxurious glossy output on almost any paper type, it makes it difficult to write on. This may not be important to everybody, but in a publishing environment this minor problem makes it impossible to use the output for proofing, because you can't write on it. Thankfully, this problem is now solved by the lighter ink coverage, without detracting from the image quality.

When it comes to speed, the Oki really has broken new ground and the Phaser can't keep up – at least this model can't. In standard mode it can output at a very respectable 8ppm, and in fast colour mode it can go as fast as 16ppm. However, the colour in fast colour mode isn't useable.

First page to print speeds should be good, but we found them a little slower than the previous Phaser model. It took almost two minutes to get our,

admittedly heavy-duty, page out. This is almost twice as long as the previous Phaser 850.

The page we use for these tests is known (and feared by manufacturers) as the Printer Killer test. It consists of a 1MB eps file of pure PostScript shenanigans. There are dozens of graduated tones, mixes, fine lines and anything else we could come up with. The small file size means network speed is removed from the equation, but it belies its destructive capabilities. Three years ago printers were regularly taking 10 to 15 minutes to print the same file, so things have improved greatly.

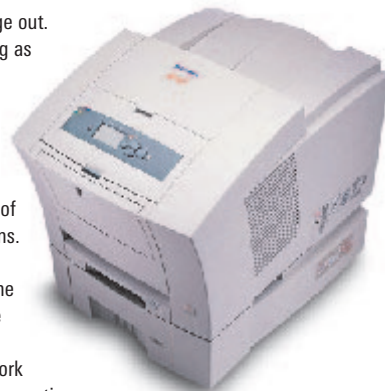
## Macworld's buying advice

Both printers excel at what they do. The Xerox Phaser is ideal as a printer for rough proofing, printing presentations and general office duties with an arty angle. The new lighter ink coverage finally makes it possible to write on, making it a favourite with our sub-editors – so long as A4 is big enough.

If you need A3, then the Oki offers super-fast colour, though the print quality suffers slightly. But slightly less than perfect colour doesn't mean it's bad colour.

The standard of laser (or LED) printing is actually very high; it is just that the Oki output has some slight banding. This might preclude it from being used for some high-end things, but, in a busy office, the speed benefits outweigh the quality issues.

David Fanning



## Simple guide to Mac OS X

## Mac OS X for Dummies

**Publisher:** Hungry Minds

**Authors:** Bob LeVitus & Shelly Brisbin

**ISBN:** 0-7645-0706-0

**Pros:** Plain-English advice; inexpensive; plenty of tips; technical explanations.

**Cons:** Could have done with it months ago.

**Price:** £16.99

**Star Rating:** ★★★★★/9.2

There are as many people scared of Apple's next-generation operating system (Mac OS X) as there are excited. These upgrade knee-shakers are right to be nervous, because, for all its familiarities, X takes some getting used to.

Navigating the new desktop, networking to non-X Macs, connecting to the Internet, using the Dock, coping with Classic, managing your files – moving to Mac OS X is not going to be quite as easy as Apple would like you to think.

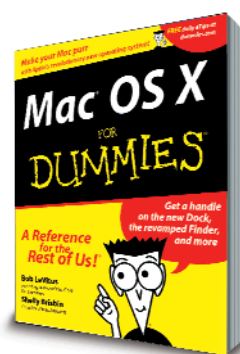
However, upgrading to this super-modern, Unix-based operating system

will still be one of the best things you do to your Mac, but you'll need help.

## Macworld's buying advice

Every month, *Macworld* publishes how-to articles and plenty of tips to make the passage to Mac OS X as easy as possible. For an immediate jump-start, invest in *Mac OS X for Dummies*, which has over 300 pages of tips, walkthroughs and explanations. As with all For Dummies books, it's aimed at all starters who want to learn quickly and easily.

Simon Jary





Streaming-media aid

## CineStream 3.0

**Publisher:** Media 100  
(01344 412 812)  
[www.media100.com](http://www.media100.com)

**Pros:** Ideal for adding interactivity to Web sites when working with digital video.

**Cons:** Not as fully featured as Adobe Premiere 6.0.

**Min specs:** 604 processor; free PCI slot; 128MB RAM; Mac OS 8.6.

**Price:** £339 (excluding VAT)

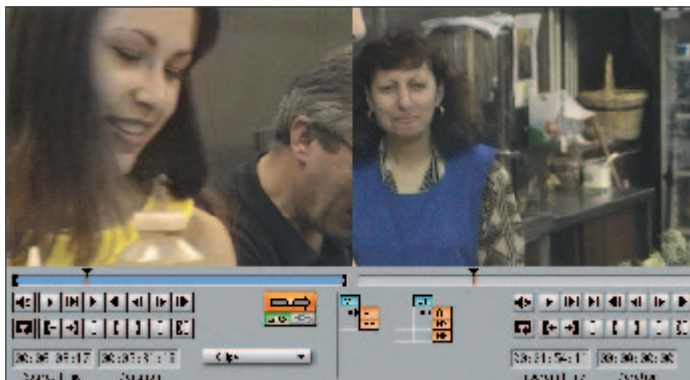
**Star Rating:** ★★★★★/7.6

**M**edia 100's latest offering is aimed at the Web designer who wants to add interactivity to streaming-media programs to trigger graphics, Flash animations or Java applications in sync with video or audio on a Web site. Formerly known as EditDV, the name has been changed to CineStream to reflect its new EventStream capabilities. EditDV was originally sold as a competitor to Adobe Premiere with three main windows – the Monitors window, the Project window, and the Composition/Sequencer window.

A separate Capture window lets you capture DV video and audio clips. You can also import image files, QuickTime movies, music from CDs, and various graphics and animation files.

The Project window is where you organize your audio and video source clips. Like most video-editing applications, CineStream includes a comprehensive selection of effects filters – an FX monitor replaces the Program monitor to let you preview these. Keyframes let you create dynamic effects that change over time. A keyframe is automatically created at the beginning of any filter. When you adjust the controls, you create additional keyframes.

Progressive settings for each frame between the keyframes are automatically calculated to create the final effect. When you want to fine-tune your cuts, the Monitors window shows the incoming



### Progress monitor

*CineStream's Monitors window has a player on the left where you review source clips, mark in and out points, and transfer selections into the Composition/Sequencer window to create a sequence to form your program. This is then displayed in the right half of the Monitors window.*

and outgoing clips in the two halves as a Trim monitor. Plenty of standard and custom transitions are provided, and you can layer multiple tracks of video for complex compositing effects.

The new History window lists tasks as they are created, and provides 1,000 levels of undo. The most powerful new feature lets you add interactivity to your streaming media using EventStream filters. Events can open URLs, change movies, annotate sections of movies, or display text when played in a Web-based player – such as QuickTime Player, Windows Media or RealPlayer. You can print your final program via FireWire to

DV videotape, or export it to a variety of digital formats – including QuickTime, AVI, BMP and DV Stream – for viewing via the Web or CD-ROM.

### Macworld's buying advice

CineStream is an important tool for Web designers on account of its new EventStream capabilities – which Premiere lacks. For straightforward video editing, it provides competition for Premiere at a lower price – but lacks several of the more sophisticated audio and video effects, and other advanced features that you will find in Premiere.

**Mike Collins**



Cubase synth plug-in

## Waldorf Attack 1.0

**Publisher:** Waldorf  
[www.waldorf-music.de](http://www.waldorf-music.de)

**Distributor:** Arbiter  
(020 8202 1199)

**Pros:** Wide choice of simulated percussion synthesizer kits makes it easy to use straight out of the box.

**Cons:** Unrealistic simulations of some of the classic sounds it claims to emulate.

**Min specs:** 250MHz PowerPC 604e; Mac OS 8.0; 64MB of free RAM; VST 2.0 compatible host application that supports virtual instruments, such as Cubase VST 4.1 or later.

**Price:** £110 (excluding VAT)

**Star Rating:** ★★★★★/8.1

**I**f you fancy some electronic percussion sounds for Cubase, then try the Waldorf Attack VST Instrument plug-in. Attack can emulate the sounds of classic analogue drum-synthesizer sounds, such as the TR808 and Simmons SDS-5 bass. Shakers and maracas can also be simulated.

Complete simulations of these classic kits are provided – or you can create versions using Attack's powerful synthesis controls. Two oscillator sections are provided, each with a choice of waveforms, tuning and envelope controls. You can also use the Crack controls to create handclaps using an amplitude-modulation technique.

Two envelopes are provided – each with the usual attack, decay, sustain and release controls – and a mixer lets you blend the sound of the oscillators and Crack modulator before feeding these to the comprehensive filter section. A delay section lets you create modulation effects, and the amplifier section provides eight audio outputs, which are routed via the channel mixer in Cubase. So, you can add EQ or effects to the drum sounds. Each Attack drumkit can have up to 24



### Music maestro

*Once installed in the VST plug-ins folder, you can use the VST Instruments window in Cubase to select Attack from the list of installed virtual instruments on your system.*

different sounds and 30 preset kits are provided. These kits are grouped into banks of 16 complete kits, and two banks are included on the CD-ROM to get you started. Installing and using Attack in Cubase is straightforward.

A click on the Edit button in the VST Instruments window brings up the edit window for Attack. Now you can select up to 16 Attack instruments as MIDI track destinations in Cubase's Arrange window – each on separate MIDI channels. A five-octave keyboard is provided in the Attack Edit window, so you can audition any

sound at the click of a mouse. You can also control any of the functions of the Attack using MIDI-controller data from an external unit with knobs and faders.

### Macworld's buying advice

I compared the simulated TR808 kit with a real TR808, and found the Attack simulations fairly disappointing. On the other hand, the CR78 simulation was excellent and several of the electronic kits are very usable. At the asking price, this one is well worth going for.

**Mike Collins**





## Mono inkjets compared

**A**lmost everyone is familiar with the term paper jam, as well as some of the more cryptic messages communicated by printers. Everyone from big businesses to small offices keeps their printers running full-time – and using them has nearly become as second nature as dialling a telephone. We looked at four monochrome laser-printers, and found that they all produce crisp text, but vary in usability and speed.

## Inkjet versus Laser

Colour laser printers have dropped in price, and many inkjet printers deliver sharp text, network options, and print speeds fast enough to satisfy the needs of some small workgroups. But the monochrome laser-printer remains the workhorse of day-to-day office printing because of its print quality, speed, and durability. We tested: the GCC Elite 21 N, the Minolta-QMS



## Testing for speed and quality

MODEL	PHOTOSHOP 6.0.1	WORD 98	GREY RAMP	TEXT QUALITY	PHOTO IMAGE
GCC Elite 21 N	127	136	Excellent	Excellent	Excellent
Hewlett-Packard LaserJet 4100n	61	113	Good	Excellent	Good
Lexmark Optra T614nl	46	106	Excellent	Excellent	Good
Minolta-QMS PagePro 4100GN	193	150	Good	Excellent	Good

Lower is better      Lower is better

Scores are in seconds. We printed a 40-page Word document at 600-x-600dpi and a 19MB Photoshop document at best resolution. We recorded the time it took to output the documents from the moment we hit the print button until the last sheet dropped into the output bin. The documents were then judged by our panel of experts on horizontal and vertical grey ramps, text quality, and image quality of the photo. Each document was rated Excellent, Good, or Poor. The test system was a G4 500MHz running Mac OS 9.1 with 128MB of RAM and virtual memory enabled for Word and disabled for Photoshop. – **Macworld Lab testing by James Galbraith.**



## Printability

The GCC Elite 21 N (below, left) topped our tests. The Minolta-QMS PagePro T614nl (below, top) is the cheapest of the bunch, but has a low resolution and slow print speed. The HP LaserJet 4100n prints excellent text, but was let down by its photo-image quality.

PagePro 4100GN, the Lexmark Optra T614nl, and the Hewlett-Packard LaserJet 4100n. All include 100BaseT ethernet and are aimed at small to medium-size workgroups.

The GCC Elite 21 N, HP LaserJet 4100n, and Lexmark Optra T614nl all feature a similar footprint, weight, and paper capacity. Plus, each has an LCD screen to access printer functions. In comparison, the Minolta-QMS PagePro 4100GN is smaller and lighter – but with its exposed, low-capacity, inkjet-like paper tray, the printer occupies the same office real estate as the larger models. Instead of an LCD screen, the PagePro 4100GN uses one button and a confusing combination of three coloured flashing lights to communicate the status of the printer to the user.

## Trouble free

The drivers for each printer installed easily – we were able to successfully create a desktop printer and print to each without any problems. While all these drivers allow you to choose print resolutions and paper-handling options from the print menu, two offer added customization. The LaserJet 4100n drivers offer the most

complete set of features: four different option menus to save a job to the printer, choose a security PIN, and use the LCD to print directly. Watermark and overlay options are also available, and the LaserJet 4100n has a built-in Web server for remote administration. The T614nl offers an easy-to-use slider bar to adjust toner darkness settings.

## Run out

In the speed department, the Lexmark Optra T614nl led the pack in printing both the 40-page Microsoft Word test document and the Adobe Photoshop test document. While office document results generally tracked the printers' quoted page-per-minute speeds, the Photoshop print times were more varied (see "Testing for speed and quality").

continues page 65



## Monochrome laser printers compared

COMPANY	CONTACT	PRODUCT NAME	STAR RATING	PRICE *	PROS	CONS	MEMORY	PPM **	MAX DPI	CAPACITY ***
GCC	020 8754 6000	Elite 21 N	★★★★/8.2	£899, plus around £40 for an additional 16MB of RAM.	Low price; impressive photo-image quality; excellent overall print quality.	Slower print speeds than HP or Lexmark; required additional RAM to print at 1,200-x-1,200 dpi.	16MB included out of the box; 32MB installed for testing	21	1,200 x 1,200	550
Hewlett-Packard	08705 474 747	LaserJet 4100n	★★★★/7.5	£1,289	Excellent text; built-in Web server for remote administration.	Photo-image quality not as good as that of GCC or Lexmark.	16MB	25	1,200 x 1,200	500
Lexmark	08704 440 044	Optra T614nl	★★★★/8.0	£1,449	Fast; excellent text; good graphics.	Most expensive; photo image quality slightly behind that of GCC.	16MB	25	1,200 x 1,200	600
Minolta-QMS	01784 442 255	PagePro 4100GN	★★★★/7.1	£595	Low price; excellent text.	Low-capacity paper tray; lower resolution; slowest print times.	8MB	18	1,200 x 600	250

\* All prices exclude VAT; \*\* Pages per minute; \*\*\* Capacity in sheets of paper.

The ability to print high-resolution images depends on the way a printer uses available RAM to buffer pages, and handles general housekeeping chores. To keep costs down, printers, like CPU systems, often ship with less-than-optimal RAM. 16MB of RAM is sufficient for printing high-resolution text and office-type graphics – such as charts and graphs – but it's not necessarily adequate for high-resolution image files.

### Bump it up

Just as we recommend upgrading to at least 128MB of RAM with a low-end iMac, we recommend upgrading to 32MB of memory or more for optimal performance when printing high-resolution graphics on these networked monochrome laser printers.

The T614nl and LaserJet 4100n were able to print the Photoshop document with their shipping configuration of 16MB of RAM, but the Elite 21 N required an

additional 16MB in order to print our high-resolution document at 1,200-x-1,200 dpi. The PagePro 4100GN can't print at this resolution, so memory wasn't a factor.

To test image quality, we printed office documents that included text, graphs, charts, and photos. All four printers offer excellent text quality at 600dpi. For graphics, the PagePro 4100GN is at a disadvantage because its maximum resolution is limited to 1,200-x-600dpi (the competition offers 1,200-x-1,200dpi). Although the PagePro's text quality did not suffer from the lower resolution, images showed some banding and artifacts. Overall, our jury found that the Elite 21 N prints excellent grey ramps and photo detail with good contrast. The T614nl follows close behind, with excellent ramps, very good image details, and good contrast. The LaserJet 4100n performed strongly across the board, while the PagePro 4100GN printed fair ramps and detail with good contrast.

Again, the PagePro 4100GN's lower resolution resulted in printed artifacts appearing on the page.

### Macworld's buying advice

All four of these printers produce great text and have easy-to-use features, but the Lexmark Optra T614nl and the GCC Elite 21 N stand out from the rest.

Though the T614nl is the most expensive printer we tested, it's also the fastest and produces excellent text and good graphics. The Elite 21 N has a lower price and won the photo-quality jury, but it was noticeably slower than both the T614nl and the HP LaserJet 4100n in our speed tests.

James Galbraith



### Topped out

Lexmark's Optra T614nl was just pipped to the top spot by the Elite 21 N, but its text quality is excellent.



The leader in portable MP3 players

## 6GB Jukebox Recorder

Manufacturer: Archos (01672 810 366)

Pros: A whole CD collection in a tiny box; never have to buy extra media; sturdy.

Cons: Heavy.

Min specs: USB.

Price: £299 (including VAT)

Star Rating: ★★★★★/8.8

**I** get really sick of MP3 players pretending they have the capacity to play two hours of music, when they have only 16MB of storage. The only way you could get that much music would be if you compressed it so much that it sounded like Thomas Edison reciting 'Mary Had a Little Lamb'. At last, somebody, namely Archos, has come up with a proper, useable, high-capacity MP3 player.

The 6GB Jukebox recorder is actually much more than a player, as it includes all kinds of extras to basic MP3 playback.

The first thing you need to do is load your MP3 collection. If you're like me, you'll already have a fair few tracks in your iTunes folder. If so, I wouldn't want to fiddle with the included software – though Music Match compares well with iTunes. It allows you to select tunes in a playlist, but you can do this from the player itself.

It would be nice if iTunes had the capability to connect directly to the Jukebox, but you can easily copy

the files across manually. When you load the software, you plug the Jukebox into the Mac using USB. It then appears on the desktop as a volume. You simply copy a whole folder with sub-folders for albums and artists across to the player. Unless you're particularly enthusiastic about music, the 6GB capacity will be plenty. It should fit around 100 whole albums, or around 6,000 minutes of good-quality MP3s. Even if you filled the whole disk with music, it would take you the best part of a week to listen to it. It really puts other MP3 players to shame.

### Added extras

If that isn't enough, you can also use the Jukebox to record audio. While I wouldn't recommend the internal mike for recording bootleg concerts, it works fine for recording interviews or lectures that you may fall asleep during. Quality can be greatly improved by adding a microphone.

If you want to get your vinyl into MP3 format, you can even plug in an analogue audio input. Unfortunately, we don't have such arcane equipment around the office, so we can't vouch for the quality – but the ability is there.

Playing the tracks you have loaded is a breeze. Each folder you copy across is listed by name. You navigate the folders or tracks from the arrow keys. Click up and down to scroll through them, or right to open them. If iTunes was used to rip the MP3s from the CD, it puts the albums in neatly named folders. This means you may be able to copy the whole of your MP3

collection across without any special configuration.

Power is supplied by rechargeable batteries, charged by plugging in an adaptor.

### Macworld's buying advice

I really can't think of any reason to buy a different MP3 player. All the others I have seen are flawed in some way, while this one simply works. It has enough capacity for all my CDs, and if there were more I don't think I would necessarily need more than 100 hours installed anyway.

The price may appear high, but if you add up the cost of additional media needed to get just an hour or two of storage in other players, it suddenly turns into a bargain.

David Fanning



### Staying power

With 6GB of storage – about 6,000 minutes of good-quality MP3 files – the Archos Jukebox is easily the best portable MP3 player around. It kicks Iomega's HipZip into touch, although it weighs a little a more.





## AceCat Flair USB Tablet

**Manufacturer:** Ace Cad Enterprise  
www.acecad.com.tw

**Distributor:** Mac Solutions  
(020 87951177) www.macsol.co.uk

**Pros:** Cheap; great software bundle.

**Cons:** Flimsy build; pen can be unresponsive.

**Min specs:** System 7; USB.

**Price:** £39 (excluding VAT)

**Star Rating:** ★★☆☆/6.9

With the demise of CalComp, it would seem that Wacom could rest easy as the undisputed leader in the Mac-graphics tablet sphere. But now along comes the Taiwanese company Ace Cad to stir up the playing field at the lower end of the market, with the Flair USB graphics tablet.

So how does this sit against Wacom? It's cheap for a start, coming in at £49 as opposed to the £85 Graphire, Wacom's nearest competitor. It's in the now familiar translucent blue of the original iMac (Wacom has the Graphire in a multitude of colours), and instead of being part of the tablet, as is the case with the Wacom device, the penholder for the Flair is separate. It stands freely with a helpful little hatch in the base for storing spare nibs and suchlike.

On first inspection, the Flair tablet – and especially the pressure-sensitive pen – seems a little flimsy. To fit the battery for the pen (supplied) you have to take the whole thing apart, which doesn't really scream quality. The USB cable is mounted at a strange angle, and looks likely to suffer from stress damage after regular use.

However, the only real way to test a

tablet is have a good old scribble with it using the bundled graphics package, which in this case is the excellent Art Dabbler.

After plugging the tablet into a spare USB port you can use it right away for guiding the cursor around. However, to take advantage of the pressure-sensitive features of the pen, you have to install a driver and control panel. The Flair allows the simultaneous use of a USB mouse – which defeats the purpose of its advertised "mouse replacement" tag, but is fine for this reviewer.

The pen has adjustable pressure sensitivity (512 levels – count 'em) and three buttons: the tip button, activated by pressing the tip downward, and two barrel buttons on a rocker switch. These can be customized via the control panel. This lets you, for example, control click with one button – which is always handy for those contextual menus.

The pen doesn't need to be in direct contact with the tablet, having a "reading height" of 0.27 inches. This means that



the pen can be used to trace drawings, maps, pictures, or illustrations on the tablet. You can also trace objects placed under the clear overlay that already has a paper drawing of a cartoon cat attached for you try out your tracing skills, and get used to the pressure-sensitive pen.

### Macworld's buying advice

In all tests, the Flair performed adequately – although the active area of the tablet is fairly small and the pen is not always the most responsive tool. That said, for a knock-down price, you're getting a USB graphics tablet and some great software to use it with.

**Michael Burns**



## MPDD Desktop Doubler

**Manufacturer:** Village Tronic  
www.villagetric.com

**Distributor:** AM Micro  
(01392 426 473)

**Pros:** Extends workspace; minimal installation.

**Cons:** Poor manual.

**Min specs:** Mac or VGA display; spare PCI slot.

**Price:** £60 (excluding VAT)

**Star Rating:** ★★★★★/7.8

Almost every Web design, video and graphics package these days seems to have a multitude of palettes and panels, so it's good sense to increase your cluttered workspace. Village Tronic has come up with the MPDD Desktop Doubler.

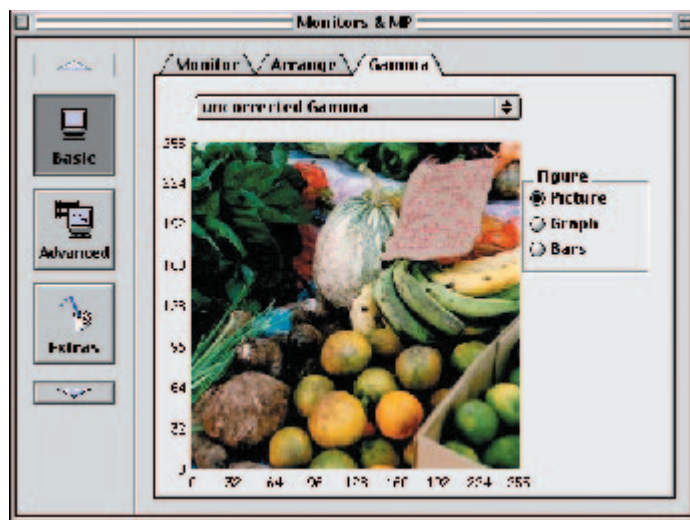
Much cheaper than a new 21-inch CRT or Apple Cinema Display, the MPDD is used in conjunction with another graphics card to extend the video signal across two screens. This allows you to access all your palettes on one screen, while leaving the other free to use as a canvas.

Installation is fairly simple, merely a case of slotting the card into a spare PCI slot and attaching your second display to one of the MPDD's inputs. Village Tronic recommends that the biggest monitor and best graphic-card combination should be assigned as the main display, leaving its card to power the secondary screen.

The card itself has no 3D acceleration, but can support millions of colours at resolutions up to 1,024-x-768 pixels at 75Hz and thousands of colours up to 1,600-x-1,200 at 60Hz.

There's no paper manual, but the installer on the CD places a PDF version, and Village Tronic's Help Centre in HTML form on your hard disk, as well as drivers and a control panel.

The Monitors and MP control panel provides control over the form and



### Panel beater

The MPDD's control panel has a wide array of specialized dual-display options, as well as all the usual monitor-imaging controls.

function of the two displays. Here you select which is to be the main display, the arrangement of the screens, the TV controls, and the usual monitor functions.

The MPDD supports all Apple monitors and VGA monitors without an adaptor, and can be connected to a TV using an optional Mac-Scart cable.

Initially, dragging icons and windows across to the second display is weird, but it's tough to stop once you're used to it.

### Macworld's buying advice

Village Tronic makes a great deal about this being a Mac product designed from the ROM up, with only one extension installed to reduce system conflicts. However, I had problems with a PCI-card conflict, so make sure you have only the MPDD and one other graphics card installed. If you have a monitor doing nothing, MPDD could save it from the tip.

**Michael Burns**



Educational software

## Reading Zone

**Publisher:** Sherston Software  
(01666 843 200)  
www.sherston.com

**Pros:** Comprehensive content.  
**Cons:** Badly designed in places.

**Min specs:** System 7.6.1;  
32MB RAM.

**Price:** £49.95 (excluding VAT)

**Star Rating:** ★★★★★7.2

## Hide and Reveal

**Publisher:** Sherston Software  
**Pros:** Versatile.

**Cons:** Requires projection equipment to be effective.

**Min specs:** System 7.6.1;  
16MB RAM.

**Price:** £31.95 (excluding VAT)

**Star Rating:** ★★★★★6.8

## Random Numbers

**Publisher:** Sherston Software  
**Pros:** Fun graphics.

**Cons:** Limited applications.

**Min specs:** System 7.6.1;  
16MB RAM.

**Price:** £31.95 (excluding VAT)

**Star Rating:** ★★★★★4.9

When I was in middle school, a lesson that involved watching the telly was a right result. If any of our teachers had wheeled out a computer as part of a class, they'd probably have needed a mop and bucket to cope with our excitement – and a forklift truck to carry the machine. For today's schoolkids, PC-based lessons are as commonplace as Pokemon cards – so it's down to the software to both absorb and excite them.

Sherston Software has released three new educational titles designed for schoolroom use.

The weightiest of these is Reading Zone, an interactive title designed to help Year 6 pupils' understanding of different reading skills. These include definitions, information-retrieval, argument, comprehension, spelling and grammar.

The lessons are conducted by Shlek, an alien who is stranded in space because all his files have been translated into English. He relies on the pupil's help to sort through these files and identify the correct answers. I can imagine this approach being absorbing for children, even though many of the lessons will tax them. It's the Holy Grail of any learning tool: fun but effective. Reading Zone also has a teacher's section, which allows lessons to be logged and marked.

It does have a glitch, though. When it comes to clicking on an answer from a



Your number's up

Hide and Reveal (above) and Random Numbers (below), are both designed as interactive tools for teachers, for use in front of a class.

list of alternatives, the text-highlighting function is out of kilter – making it difficult to determine exactly which option has been selected. I can just hear it now: "But teacher, that's the one I tried to select!" It needs sorting.

Hide and Reveal is much better value than Random Numbers, and is designed to hone pupils' analytical and hypothesizing skills. It does this by creating sequences of numbers, equations, symbols, shapes and patterns. Each member of the sequence is revealed from behind a card – the aim being for pupils to guess the next in line.

Random Numbers, though, is something of a white elephant. It can generate randomly any class of number – fractions, integers, natural – using an array of cutesy graphics to reveal them. Apart from being great for classroom games of bingo! I can't see the point.

Random Numbers' most useful tool – creating sequences of numbers – is already covered by Hide and Reveal.

### Macworld's buying advice

Reading Zone can be used as part of the National Literacy Strategy Framework for Year 6, and will be a useful teaching tool. The other two titles are designed for class participation, so images will need to be projected for them to be of real use. Data projectors don't cost less than £1,200. Ouch.

Sean Ashcroft



Simple accounts-app

## DO\$H Cashbook

**Publisher:** DO\$H Software  
(0800 026 4666)

**Pros:** Easy to use; cheap; Mac friendly.

**Cons:** Limited feature set.

**Min specs:** Mac OS 8.0;  
10MB disk space; 16MB of RAM.

**Price:** £59 (excluding VAT)

**Star Rating:** ★★★★★8.5

OK, so you've got the business plan approved and you're ready to give it a go as a sole trader. But you're terrible at bookkeeping. You're doomed.

Help may be at hand from the oddly named DO\$H Cashbook. It's a low-cost bookkeeping program aimed at small businesses.

In a departure from the normal cost-cutting practices of developers, DO\$H Software has remembered to include a sturdy ring-bound manual, with clear instructions on how to get started organizing your finances. There's a helpful Apple Guide – so it's clear this is not just a port from the PC – and a tutorial to get you up and running. Another plus point is that it's clearly aimed at the UK business-user, with a corresponding understanding of, and adherence to, British accounting practices.

The software uses codes to identify types of receipts and statements. These are set up according to the type of business you select when you begin for the first time – sole trader, limited company or partnership. You can use the supplied codes, import others or set some up yourself, but always before entering any data into your cashbook. You can also edit and modify existing codes and select



Loadsamoney

Loadsapalettes too, but DO\$H certainly keeps you organized.

which items are liable for inclusion in your VAT account, if you have one. All items that you then enter are tagged with your codes and a description, enabling the package to work its magic.

There is an area for entering receipt and payments details of your customers and suppliers in a similar way to the codes, but DO\$H Cashbook also builds up a list of these details on the fly while you are inputting cashbook receipts and payments, storing them for future use.

When making a cashbook entry, DO\$H offers a pop-up list of commonly used abbreviations for bank transactions, such as BGC and INT. Codes are also offered in this handy fashion, adding to the idiot-proof feel of the package. Another useful item in the cashbook entry dialog is the ability to add a number of receipts from a single

transaction in the sub-entries pop-up. This keeps everything organized and together, instead of having multiple entries in your cashbook from the same transaction.

DO\$H of course offers the user the chance to view a summary of transactions of the cashbook at any point, making it easy to see where the money in your account is coming from and going to.

### Macworld's buying advice

If you are looking for a cheap and cheerful – OK, that's pushing it with bookkeeping – way of using your Mac to manage your money, you can't really go far wrong with DO\$H.

Michael Burns



Try VectorWorks for yourself – the demo is on this month's CD.





Create perspectives in Illustrator

## Perspective

**Publisher:** HotDoor [www.hotdoor.com](http://www.hotdoor.com)

**Distributor:** Creation Zone UK  
(020 8282 8400)

**Pros:** Easy to use; multiple point perspective; isometric projections.

**Cons:** Few primitive objects; shapes cannot stay constrained to grid when moved.

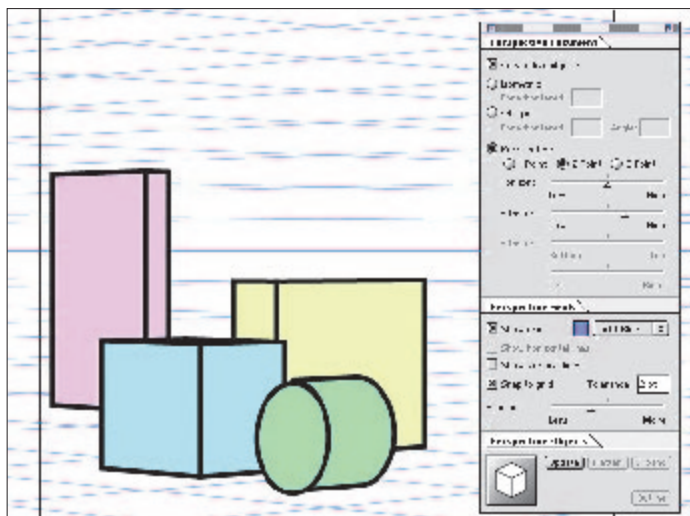
**Min specs:** Adobe Illustrator 8.

**Price:** £179 (excluding VAT)

**Star Rating:** ★★★★★/7.6

**H**otDoor perspective is a plug-in for Adobe Illustrator that, as the name suggests, adds an easy-to-use perspective-drawing capability to Illustrator 8 or later. It creates a guide layer that allows you to constrain lines to the vanishing points of a one-point, two-point or three-point perspective. As well as perspective grids, you can also create isometric projections (for instance, 30 degree) and oblique projections (where the depth of a 3D object is represented at a 45-degree angle).

It's simple to use – accessible as a palette from the window menu – and allows you to switch between the various perspective and other projections easily. Determining the vanishing points is done using a number of sliders, which set where the horizon should be, and then the angle of the grid lines that converge on the Vanishing Point.



As well as the control-panel palette, HotDoor Perspective also adds a Cylinder and Cuboid primitive tool to the tool palette. Using these allows you to quickly create the representations of 3D shapes that conform to the projection you have set-up. If you change the projection, they will change as well.

HotDoor Perspective compares favourably to FreeHand 9's built-in perspective support, being easier to use, and, also, better integrated with the rest of the application. FreeHand's Perspective control feels horribly bolted on, is tricky to use, lacks the isometric and oblique projections, and has no object primitives.

Perspective, although a plug-in, fits in with the rest of the application perfectly.

However, a couple of features would give the plug-in more usefulness, such as a greater number of primitive shapes, for example cones, spheres and pyramids. Also, the cylinder tool seems to work only lying on its side. Secondly, it would be great if all shapes that were constrained to the perspective grid could be moved and stay constrained to the grid.

### Macworld's buying advice

If you do a lot of perspective illustrations or technical drawings in Illustrator, and don't want to use a fully formed CAD tool, then HotDoor Perspective is an ideal purchase.

**Martin Gittins**

### Open door

Hotdoor Perspective can work with one-, two- or three-point perspectives.



Try VectorWorks for yourself – the demo is on this month's CD.



Tempo and pitchshifting plug-in

## Pitch 'n' Time

**Publisher:** Serato [www.serato.com](http://www.serato.com)

**Pros:** Straight-ahead varispeed mode; advanced pitchshifting and time-compression algorithms.

**Cons:** Can't pitchshift without shifting formants.

**Min specs:** PowerPC; Pro Tools 4.0.

**Price:** £553 (excluding VAT)

**Star Rating:** ★★★★★/9.0

**E**veryone wants to stretch and warp digital media these days – and audio people are no exception. Serato's Pitch 'n' Time 2 is an AudioSuite plug-in for Pro Tools. It lets you alter pitch and tempo graphically or numerically.

Professional tape recorders use a varispeed to control their motors. Run it fast, and voices sound like Pinky & Perky; run it slow for the voice of doom.

The digital-audio equivalent involves varying the sample rate. Pitch 'n' Time 2 lets you do this using its Varispeed Mode

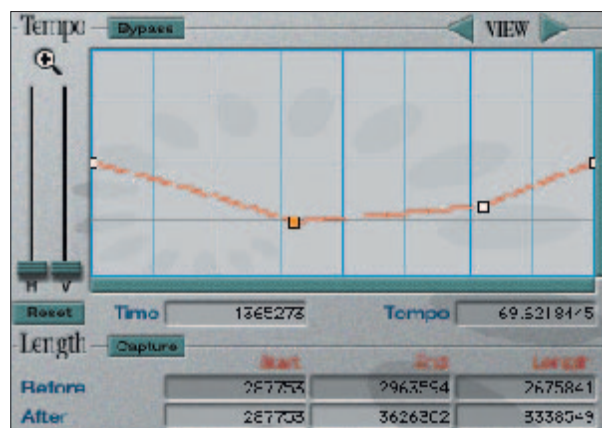
– where altering the tempo also alters the pitch. It's simple, but effective.

The clever trick is to change pitch without affecting tempo – or vice versa. This is what Pitch 'n' Time is really all about. You can change the tempo from half to double-speed independently of pitch. And, you can pitch shift up or down by up to 12 semitones independently of tempo. Previewing is excellent, just move the pitch or tempo sliders while previewing and you hear the audio change almost immediately.

The Pitch 'n' Time window has three sections – Tempo (time-stretching), Length, and Pitch (pitch-shifting). The Length section shows the start, end and length of your selection. To change the length, just type in what you want.

Click the view arrow at the right of the Tempo section and The Variable Time-stretch Panel reveals itself – offering an editable tempo automation graph. Click on the red line to insert handles then drag these up or down to draw your tempo graph. The same feature is available for the Pitch section.

The Tempo section offers a third



panel called Morphing Time-stretch. This lets you alter the timing of notes played within a musical phrase.

### Macworld's buying advice

The closest rival is Wave Mechanics' Speed. Pitch 'n' Time 2 has the edge due to its morphing time-stretch and varispeed features. It also two allows finer control.

**Mike Collins**

### Time to shift

The Tempo section's time-stretching capability lets you change the BPM of your loops. The Pitch section lets you alter the pitch of, say, an out-of-tune instrument that is consistently flat or sharp.



## Eye-One

**Manufacturer:** Gretag-Macbeth

[www.i1color.com](http://www.i1color.com)

**Distributor:** Cancom

(0800 393 696)

**Pros:** The Eye-One photospectrometer and Eye-One Share freeware make colour-reproduction an almost-exact science; LCD screens can be calibrated.

**Cons:** The £1,200 Eye-One Match device-profiler element inspires absolutely no confidence.

**Price:** Eye-One Monitor, £489; Eye-One Pro, £1,199; Eye-One Pro with Eye-One Match, £2,399 (all prices exclude VAT).

**Min specs:** Mac OS 9; 128MB of RAM; 48MB of hard-disk space; USB.

**Star Rating:**

Eye-One Pro, ★★/8.5;

Eye-One Pro with Eye-One Match, ★★/6.2;

Eye-One Monitor, ★★/5.1.

**C**IELAB. Photospectrometer. Luminance. Spectral data. Delta E. They may sound like characters from Dungeons and Dragons, but they come from a world far more labyrinthine than that: colour management.

Eye-One Pro is the top-end offering from Gretag-Macbeth. The Eye-one is a USB photospectrometer – a device that scans colour and interprets the values mathematically. The Pro part of the package consists of a colour target, Eye-One Match colour-profile software, and a digital Pantone-library. The library is for use with the bundled Eye-One Share colour-management software, which is freeware.

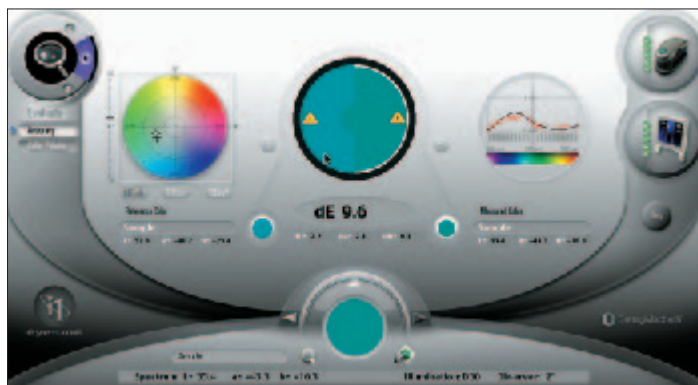
The package is aimed at graphics pros who live and die by colour accuracy. It promises colour accuracy on two levels: across localized workflows (monitor, scanner, digital camera and printer); and between designer and client.

### Colour basics

Colour accuracy from monitor to printer is ground zero for graphics pros. After all, what's the use of slaving over a project only to discover that luscious on-screen colours print out as a muddy mess? The bundled Eye-One Match (EOM) software allows one to create colour profiles for peripherals. It has a wizard-based interface, and is suitable for use by colour-management rookies. The profiles should provide a description of each device's range of reproducible colour, thus ensuring that colour is interpreted accurately across all devices. But I had real problems with the most important profiles – that for the monitor and printer.

The monitor profile is created by sticking the Eye-One to the screen (using a supplied sucker-device). It then calibrates the monitor's white point, contrast and brightness. I repeated the required process four times, creating a separate profile each time. When I switched through these in the Monitors control panel, there was a noticeable difference in the brightness from one to the next. The problem was that EOM wouldn't allow me to make identical brightness adjustments with each new monitor profile. EOM should permit the user to adjust brightness to an optimum setting via the monitor's controls. Brightness is increased or decreased until an on-screen arrow in EOM lines up with a marker that denotes the required setting. However, the moving arrow darts back and forth like a rabbit on Viagra. One of EOM's wizard messages warns that this may be the case. Thanks.

As for the printer profile – I spent many frustration-filled hours attempting to nail the bugger. This profile is created by first scanning the reflective colour-



### Match proof

Colours scanned by the Eye-One photospectrometer can be measured against the closest Pantone matches from the Library in Eye-One Match. The difference between any two colours is expressed in three ways – as a Delta E value, as a colour-space evaluation and as a spectral illustration.

target using the Eye-One and a special ruler-on-wheels that lets it scan one row of coloured squares at a time. The target is based on the industry-standard IT8 colour-calibration chart, whose colours fall within most device-colour gamuts, and which are specified in terms of device-independent CIELAB colour. Also supplied as a TIFF file in EOM is an IT8 CMYK target, which must be printed and then scanned with the Eye-One. EOM's powerful mathematics engine then analyses the two scanned charts and builds a printer profile.

### Useless profile

However, each of my attempts to create this profile was met with an "invalid profile" warning, and a suggestion that I rescan the printed CMYK target. The problem, the message told me, was that the Delta E value between two scanned targets was too wide. Delta E is the generic name used to express the magnitude of the difference between all uniform colour-spaces. It is expressed as a single number. Colour reproduction is not considered accurate unless the Delta E value between two colours is two or less. Using different print settings each time, I reprinted the CMYK target 12 times, and scanned in each new output. Every attempt at a new printer profile resulted in the same message. The rub is, EOM lets you bypass the warning message and go on to save your flawed printer-profile in the ColorSync folder. In the end, I had to use one of the "invalid" profiles. Not exactly confidence inspiring.

The best thing about Eye-One Pro is Eye-One Share (EOS) – freeware with which you can create palettes beyond the realm of RGB and CMYK, choose from a library of predefined colours, email that palette to your clients, who can then get their art team to import it into any design

application. It can measure the exact difference between the right colour and the wrong colour – so you can tell the printer or manufacturer exactly what it's going to take to get it right.

The Eye-One photospectrometer comes into its own with EOS, because – even though EOS is a useful free download – it becomes a colour-management powerhouse in the hands of Eye-One owners. This is because any colour, from anything – a tin can, or a printed page – can be scanned into and interpreted by EOS. In the Library strip at the foot of the EOS screen is displayed the closest Pantone colour-matches.

EOS also allows you to determine if your client's selected colour can be reproduced across all media they want you to use. The Convert Spot feature shows how a given colour can be reproduced on various devices. It translates the colour from the LAB colour-space into the specific colour space of an output device. I scanned Mygate's cyan from one of its ads in *Macworld*, and, in Convert Spot, selected the web-offset colour-profile that we use on the magazine. EOS gave me an exact match.

### Macworld's buying advice

Eye-One is for graphics pros, and comes in three flavours: Eye-One Monitor, which calibrates just your monitor; Eye-One Pro, which measures all types of colour and also profiles your monitor; and Eye-One Pro with Eye-One Match, which does all this and profiles input and output devices. EOM's poor showing drags down the overall score of the top-end package. I'd have been livid to have spent an extra £1,200 for the device-profiles it gave me. Eye-One Pro is the best package, as it allows the Eye-One to do what it does best – interpret colours mathematically.

**Sean Ashcroft**



### Casting an Eye

The three flavours of Eye-One all come with the eponymous Eye-One photospectrometer, which can be used for workflow-device colour calibration, as well as reading colours from everyday objects – such as Coca Cola's corporate red from a tin can.



# Ultimate Macs

The best setups for home, business,  
design studio, school, video and music.

By Simon Jary, David Fanning,  
Sean Ashcroft and Mike Collins



**A** Mac can do many things on its own – with the bundled iMovie, it lets novices easily edit their digital videos; iTunes is great for compiling MP3 collections; and there's no faster way to get yourself connected to the Internet. But a Mac's usefulness soars into the stratosphere when it's supported by the many top-quality third-party peripherals and software applications that work with it. You can choose from a selection of bargain digital camcorders to make your home movies, or you can spend a few thousand pounds buying a great setup for creating broadcast-quality productions for TV or your corporate presentation. Digital still cameras range from £249 to £3,000, according to resolution and features.

iTunes is fine for ordering and burning a CD collection, but there's tons of stuff on hand if you want to set-up your own music studio. You can quickly post digital photos on an iTools personal Web site for free, or you can design sophisticated Web sites with a Mac and the right software. Some people require Adobe Photoshop and a colour laser printer; others need only Photoshop Elements and an inkjet. An iMac is fine for many, while some of us really do need that top-of-the range PowerBook G4.

Whatever your needs, this first part in a new series of *Macworld* features will help you choose exactly what you need to create your own ultimate Mac system. In future features, we'll look at the ultimate setups for webmasters, games players, layout artists, photographers, architects, grannies, scientists, teachers...

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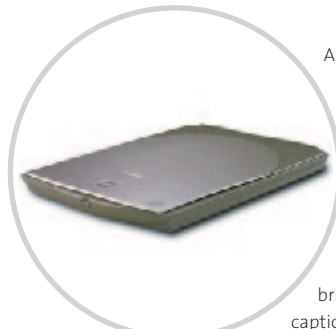




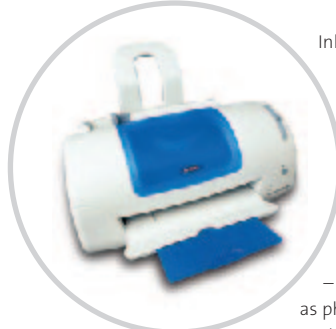
# Ultimate home Mac



It's best to go mid-range with digital cameras: models like the £350 FujiFilm two-megapixel **FinePix 2400** (020 7586 1477) offer much of what's good about this technology, but without busting your budget. The 2400 has a powerful (3x) optical zoom – a must with digital photography – and outputs sharp and richly detailed images. To touch-up your images or apply special effects, try Adobe's £79 **Photoshop Elements** (0131 458 6842), a boiled-down version of its industry-standard photo-editing application. It can stitch images to create panoramas, and offers abundant filters and styles, as well as "darkroom" tools that remedy red-eye, under/over-exposure and poor use of flash.



A decent scanner is essential for SLR buffs who don't want to miss out on the online revolution, and for anyone wishing to digitize old family albums. Canon's £149 **CanoScan N1220U** (0121 680 8062) is so svelte because it doesn't need a mains connection, drawing its power from the Mac's USB port. It offers a resolution of 1,200dpi and has a button that launches the CanoScan ToolBox onto your desktop. You can add photos to your Web site, or use the **iDisk** component of **iTools**, Apple's brilliant free Web services. You can upload images and captions into **HomePage** templates for viewing within minutes of the pictures being taken.



Inkjet printers have never been better or cheaper, with even some £50 models offering decent photo-quality output. Epson's £119 **Stylus Photo 790** (0800 200 546) is the cheapest of its Stylus Photo range. It offers edge-to-edge printing, and can output glossy images with no grain. It prints at up to 2,880-x-720dpi, which is more than enough to guarantee photo-realistic output. For quality text output – such as CVs and important correspondence – it's best to invest in decent matt-coated paper, as photocopy stock is too absorbent. The 790 is just as speedy as the more-expensive models in the range.



JVC's **GR-DVL 257** (01494 471 100) is a £749 MiniDV camcorder that's the cheapest available camcorder to offer DV-In and -Out – meaning you can transfer edited footage from your Mac back to the camcorder. The 257 boasts a monitor screen, a 300x Super digital zoom, a digital-still mode, 800,000-pixel CCD, SD memory card, software, and 500-line resolution with high-band processor. One nifty feature is the Digital NightScope for low-light shooting. For editing footage, use **iMovie 2**, which is bundled with all new Macs, or £35 otherwise. This easy-to-use software turns raw footage into polished mini-movies, complete with soundtrack, visual effects and titles. You can save movies as QuickTime files for Web-viewing or transfer them to VHS.



Good audio quality will add another dimension to your Mac experience – both turning it into a decent sound system and adding incredible depth to DVD movies and games. Harman kardon's £139 **Soundsticks** (0870 600 6010) is a striking three-piece sound system. It comprises a 20W iSub subwoofer (£49 on its own) and two speakers that can be tilted for the best sound. The ensemble is made from Apple-like transparent plastics. With SoundSticks hooked up, **iTunes** becomes the ultimate desktop-jukebox solution.



## Apple iMac SE

Your Mac at home can become your very own "digital hub". The top-of-the-range £1,199 iMac Special Edition may sound pricey, but is packed with features that add real value to your peripherals. And it looks great, too: available in Graphite, or in Apple's wacky Blue Dalmatian and Flower Power patterns. Its 600MHz G3 chip is a real racer, and its 128MB of RAM is fine for starters – you won't be left hanging around as it processes large image-files from your digital camera or camcorder. The 40GB hard disk is massive – just the job for memory-hungry digital home-movies. The slot-loading CD-RW drive is superb – burning at eight-speed. With the help of the bundled iTunes you can create a compilation-CD library, or use the CD-RW as a backup tool, letting you store important files remotely. For gamers, the iMac SE's fast 16MB ATI Rage 128 Ultra video-card is a great, and the bundled games (Cromag Rally, Nanosaur and Bugdom) are a bonus. Two FireWire and two USB ports make the iMac better than most PCs.



Part of the iMac/iBook free software bundle, **AppleWorks 6** (0800 039 1010) is a productivity program with six core capabilities. You can use it to create slide presentations, write letters, or to draw and paint digitally. In conjunction with an inkjet printer, you can use AppleWorks to create everything from banners to birthday cards, as well as flyers and CVs. Its spreadsheet capability can be used to run household finances and other projects, while names and addresses can be stored as a database, forming the basis for labour-saving mail merges for anything from job applications to party invites.

## Apple PowerBook G4

At just one-inch thin and 2.4kg (5.3lbs) light, Apple's **PowerBook G4** (from £1,899) is the business. Its G4 processor will whip through your PowerPoint presentations – although your colleagues may be too busy lusting after this titanium portable to notice.

When you're not using the matching Infocus LP130 projector, the 15.2-inch (1,024-x-768-pixel) widescreen is plenty big enough for your Excel spreadsheets and Web pages. It also offers a much-bigger screen for watching DVD movies when you're in flight – even in business class! When you're back at the office, you can connect a larger external monitor (go for one of Apple's LCD Studio Displays, as this will save desk space) via the VGA port. Play DVDs on a TV via the high-quality S-Video port. You can easily connect to the office network via 10/100BaseT ethernet. It also has two USB and one FireWire connection.

You can leave the office early, and work all the way home on the train. The only downside is that there's nothing to stop you working at home, too...

Time is money – that's why you have to pay for blindingly fast Internet connections. No one has ever accused BT of being cheap, but its Openworld ADSL (www.btopenworld.co.uk) high-speed broadband ADSL service makes real sense. If you have more than one computer in your setup, and want AirPort wireless networking and Internet access, you should stump-up £99 a month for the Business500Plus package (via ethernet). If there's just one Mac, and you don't require AirPort, the £39-a-month Business500 service (via USB) will suffice. Both offer 500Kbps downstream and 250Kbps upload speeds. ADSL is also available from ISPs such as Demon and Netscalibur.



# Ultimate business Mac

HP's £211 **DeskJet 990CM** (08705 47 47 47) inkjet printer not only features top photo-quality colour output at reasonable speeds, but its silver casing will also match your desirable titanium PowerBook. This printer will also please accountants, who'll appreciate its conservative ink usage – which will save you a lot of money in the long run, as will the duplexer, that allows double-sided printing. Infrared-printing support is a nice touch, as is the bundled PhotoStudio software.



The must-have software for all serious business people is Microsoft Office (0845 7002 000). **Office 2001** (£399) is as powerful as even the latest Windows version, Office XP. Office is a lot more powerful (and compatible with Windows PCs) than AppleWorks. You can easily swap Word pages, Excel spreadsheets and PowerPoint presentations with your Windows colleagues. Office also comes with Entourage, a personal-information manager and smart email client. A Mac OS X version is promised this autumn. Download Microsoft Outlook 2001 messaging and collaboration client for free.



It doesn't matter that Office 2001 doesn't include a database, as **FileMaker Pro 5.5** (from £219; 01628 534 158) is a quality database solution that's compatible with Mac OS 9, OS X and Windows 2000. FileMaker is flexible, and interfaces well with Microsoft Office on both platforms, as well as letting you easily develop powerful, customized business solutions. A Web Companion offers single-click Web publishing. Excel files can be drag-&-dropped onto FileMaker Pro 5.5 to instantly create functional databases ready to publish to other FileMaker Pro users or on your intranet.



No businessperson worth their suit should be without a Palm-based personal digital assistant (PDA) for carrying address books and calendars, gathering email, making notes and synchronizing with their office and home Macs. The best Palm PDA right now is Handspring's £280 **Visor Edge** (020 7309 0134), which, in silver, perfectly complements the PowerBook G4, of course. The Visor Edge is just 1cm thick, and features a nifty address-lookup button. Extra modules can be added via the detachable SpringPort.



When you're showing presentations to clients and colleagues in far-away offices, you don't want to show-up with backache and a straining briefcase. Infocus's **LP130 projector** (0800 028 6470) weighs just 1.7kg, and measures only 170-x-219-x-51mm. Its output isn't compromised, though – boasting a super-bright 1,100 ANSI lumens. And at £3,290, it's readily affordable for most boardrooms. Like the other stuff here, it also beautifully matches your PowerBook G4.





# Ultimate design Mac



Designers are best served with a quality CRT monitor – which offers superior colour fidelity to flat-panels. LaCie's £769 **Electron 22 Blue II** (020 7872 8000) display has an impressive 1,800-x-1,350-pixel resolution, and gives excellent contrast, sharpness and colour. The optional £400 Blue Eye hardware colour calibrator guarantees perfect colour matching – which will save you both time and money. And the deep-blue hood reduces glare – saving your eyesight and improving images.



The must-have software for all graphic designers is Adobe Photoshop 6.0. The £699 Adobe **Design Collection** (0131 458 6842) is the cheapest way to buy Adobe's range of award-winning market-leading graphics software. It includes the essential bitmap-image-editor **Photoshop 6.0** (make sure you upgrade for free to the faster 6.0.1), vector-based **Illustrator 9.0**, PDF-creator **Acrobat 5.0**, and page-layout-application **InDesign 1.5**, which Adobe hopes will challenge **QuarkXPress 4.1.1**. On its own, Photoshop costs £499, so you get the rest for just £200 extra.



Let's face it, a mouse is not the artist's natural tool. We're happier with pen or brush in hand. Wacom's PL500 LCD Pen Tablet System lets you draw or paint onto the 15-inch LCD screen with a pressure-sensitive stylus. But, aside from its whopping £2,200 cost, it requires configuring to work with the latest ADC Power Macs. Until Wacom sorts this out, we recommend Wacom's older (but cheaper) **Intuos Graphite graphics tablet** (020 8358 5857), which boasts 1,024 pressure levels.



Heidelberg's FireWire-supporting **Linoscan F2650** (01242 285 100) scanner has an optical resolution of 2,400dpi, and a scan-area of 305-x-432mm. It isn't cheap (£5,495), but is comparable to five-figure pre-press scanners. The LinoColor Elite scanning software is excellent – although you'll have to spend a few hours with the detailed manual. Epson's £2,219 **Expression 1640 XL Pro** is a cheaper (but impressive) A3 alternative,



When the Power Mac's built-in CD-RW and a motorbike don't offer the speed you need to get your files to a client, ISDN is your saviour. ADSL is great for fast Web work, but ISDN is the heavy hitter when it comes to shunting massive files around the globe or over town. Hermstedt's £2,750 **Angelo** card (020 7421 1500) can connect up to 30 ISDN channels – for a transfer rate of nearly 2MBps. Check out cable-company rates, which are often cheaper than BT's.



## 533MHz DP Power Mac G4

The PowerPC G3 is a powerful processor, but the G4 is specially optimized for programs such as Adobe Photoshop. The fastest G4 chip at press time (before July's Macworld Expo) runs at 733MHz. But Photoshop users should seriously consider a Power Mac with more than one processor. The £1,799 dual-processor **533MHz DP Power Mac G4** is just 4 per cent slower than the 733MHz on general computing tasks, but up to 66 per cent faster on certain Photoshop functions. The built-in eight-speed CD-RW drive is also handy.

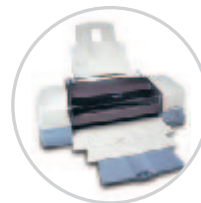
Multiprocessing is also set for further performance boosts when you choose to upgrade to Mac OS X – as soon as Adobe Carbonizes (optimizes) Photoshop for Apple's next-generation operating system.

Photoshop users should buy as much RAM as possible. If you've got the cash, splash out on a fast SCSI RAID hard-drive set-up. (For more on speed, see "Does MHz matter" feature, page 88.)



Designers need an accurate colour PostScript printer, preferably at A3 size (for edge-to-edge full-bleed prints). We recommend Epson's £3,999 **Acculaser C8500 PS** (0800 200 546), which is super-fast – spitting out our first complex test-page in just over a minute. You'll save £2,150 by opting for the A4 **Acculaser C2000 PS**.

The need for PostScript rules out an inkjet for much work – but for cheap photo-quality output for your Photoshop work, consider Epson's £339 A3 **Stylus Photo 1290**, which can handle edge-to-edge printing. HP's marvellous £237 **PhotoSmart P1218** (08705 474 747) is our top-rated A4 photo-quality inkjet.



## iBook

The £1,599 combo DVD-ROM/CD-RW iBook has got it all. It enables not just DVD-movie playback, but also the ability to burn CDs. If this doesn't make you popular at school, I don't know what will.

Adding an AirPort card means freedom from wires, so the compact, lightweight iBook can be Web-connected anywhere in the house or AirPort-equipped school/university. We've added an additional 256MB of RAM, costing around £100 – so that when Mac OS X is ready for you, the iBook will be ready too.

The great thing about using an iBook for school or college is that most of the important things are already included. It includes an MP3 player, easy-to-use movie-making software, word processing, spreadsheeting, databasing, presenting, painting and drawing software – all right out of the box. There are even a few games included, such as Nanosaur, Bugdom and CroMag Rally, for those brief moments between studying.

The iBook's trackpad doesn't take long to master, but, for prolonged use, a mouse makes things a whole lot easier on your hand. Contour's £29 **MiniPro Mouse** (020 8731 1410) is the perfect match for the iBook, as it's tiny and styled in Apple-like plastics. After you've downloaded software from Contour's Web site, you can configure the smaller second button to quickly complete your most frequent tasks. You also get a sturdy "Pack N' Go" travel case to protect it and its cable when it's in-transit with you. It fits easily into your pocket, or into your carry-bag.

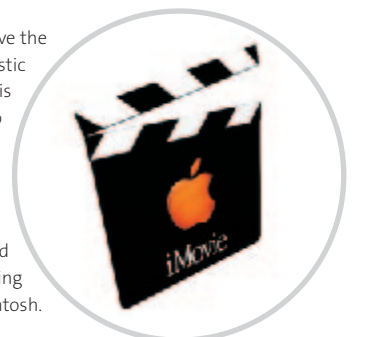


# Ultimate student Mac

It's a relatively new thing for kids to have their own portable computers, and carrying that kind of equipment around can be problematic. The £77 **Kipling Webmaster** (020 7299 9090) offers a discreet way to carry an iBook without saying "mug me". Although it looks pretty much like any old backpack, it's designed to keep an iBook safely protected. It has a padded pocket close to the lightweight metal-reinforced back, keeping the centre of gravity forward. It also includes 3M reflective patches for dark winter evenings, back pads to hold the bag away from the body to keep you ventilated, and a waterproof base to keep your iBook dry.



Every budding Spike Lee, Ang Lee or Bruce Lee will love the opportunity to edit their own movies. The fantastic thing about **iMovie 2** (included free with all Macs) is that kids can use it – in fact, it's so simple to understand, even grown-ups can use it. Whether you're making a promo for the school band or a short for drama class, iMovie is the simplest way of making a video. All you need is a FireWire-enabled digital camcorder – preferably with both DV-In and DV-Out. It has all the power of grown-up video-editing systems, with the simplicity of a Macintosh.



Microsoft Office 2001 remains the tool of choice for business, so it's priced for suits not students. **AppleWorks 6** (included free with all iBooks and iMacs) does much the same job as Office – and even has some extra stuff such as a database and painting features. When it comes to homework, AppleWorks is handy for all subjects. The spreadsheet is useful for maths and science projects, the drawing and paint tools are great for art projects, and its word-processor is perfect for essays.



As a rule, kids tend not to stay still for very long. With Apple's £79 **AirPort Card** and a £239 **BaseStation** (0800 783 4846), they can move around and still be connected to the network or Internet. Of course, this means sending them to their room is even less effective as a punishment – but it does give Internet access without the need to run wires all through your home. At school, if the other students have AirPort Cards, they can create ad-hoc networks for collaboration on projects and games.



Although the iBook is small, it's unsuitable for playing MP3s when you're on the move. That's when you need the £299 Archos **Jukebox Recorder** (01672 810 366). It is a 6GB hard disk that can hold up to 6,000 hours of music. That's over 100 CDs full of your favourite tunes that you can keep with you all the time. If that isn't cool enough, you can also use it to record directly to MP3 from an audio source. It even has a microphone to record lectures and save on note taking.



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# Ultimate video Mac

No monitor, whether CRT or LCD, beats Apple's £1,799 **Cinema Display** for resolution. The wide screen offers plenty of room for the forest of palettes common in video-editing applications, plus an ideal viewing area for widescreen productions. Over the 22-inch diagonal screen, Apple has squeezed in 1,600-x-1,024 pixels, for exceptional sharpness. Having a Cinema Display is great, but when it comes to displaying your work as it will be seen by the general public on TV, you need a **PAL** monitor that accurately displays interlaced video output – so that you can make sure your titles don't disappear off the edge of screen. Call Planet PC (01274 713 400) for prices.



Once you've produced your masterpiece – be it a birthday party or a pop promo – you'll need to get it out to your audience. For home movies, iDVD works fine, but if you're mastering a production DVD you'll need Apple's £680 **DVD Studio Pro** (0800 783 4846). It's an amazingly easy way to produce high-quality DVD productions, without the expense associated with older methods of DVD production. As long as the final product is less than 60 minutes, you can even burn your own DVD – using the Power Mac's built-in DVD-R SuperDrive.



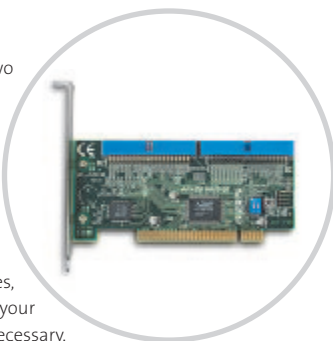
## Power Mac G4 DVD-R

The ultimate video Mac needs to be fast and have lots of RAM and hard-disk space, so we've chosen the 733MHz Power Mac G4 (£2,499) with all the trimmings. That includes the SuperDrive, for authoring DVDs that will play in standard DVD players. Memory is a commodity much-needed for this kind of work, so stuff it with at least 768MB of RAM. Currently, this extra RAM will set you back less than £150; and when 512MB RAM chips are as cheap, double it.

You might consider smaller extras such as Contour's £100 **Shuttle Pro** (020 8731 1410), designed to compliment video applications with a jog and shuttle controller. A FireWire hard drive (like Mac & More's FireLight, 01442 870 300) might come in handy if you need to move big video files from place to place.

In the past, RAID arrays were characterized by two things: they were expensive and complicated. Not any more, though. The tongue-twistingly named **Acard Ahard RAID Card** (£150; 020 8453 0162) makes RAID simple and cheap. Buying the Ahard, plus a couple of 40GB ATA drives, will cost under £500, and give you super-fast access to 80GB of storage (enough space for a feature film). Faster SCSI drives will cost more.

Setting-up is a breeze: just flip some dip switches, format as a single drive, and you're off. It all fits into your Power Mac's drive bays, so no external drives are necessary.



One of the first, and still the best for the price, the £2,299 **Canon XL-1** digital camcorder (01892 837 619) offers unmatched excellence in most areas. From its interchangeable lens to its boom-mike, it's a professional piece of equipment through and through. It's relatively light, and the shoulder-mount allows comfortable filming for hours at a time. It has a quick and accurate auto focus, and a full range of manual controls.



Whether the project is a wedding video or a Hollywood blockbuster (well, *Blair Witch* at least) Apple's £680 **Final Cut Pro 2** (0800 783 4846) is up to the job. It includes tools for compositing,

dozens of filters and effects, compatibility with all professional video formats, and excellent media management. It's an amazingly powerful solution that makes it possible

to edit broadcast-quality television without the usual expense.

Apple's **iMovie 2** is a free starting point (and closely related to FCP) – many future movie directors will look back on iMovie as their start in the business.

If you want your Final Cut Pro production to fly, you'll need Matrox's £699 **RTMac** (01753 665 624) to add hardware acceleration. This will enable you to do live transitions and effects without having to wait for them to render – allowing you to keep up with the pace of the edit. RTMac adds analogue inputs for all the main connections in a breakout box.



Although Apple's Final Cut Pro 2 is an amazingly accomplished editing system, you won't want to be without Adobe's £525 **After Effects 5.0** (020 8606 4001) – which offers top-edge video and audio effects. For 2D- and 3D-compositing, After Effects offers extensive motion controls and keyframing, along with almost-limitless effects on each layer. If that isn't enough, there are hundreds of plug-ins available to further extend its capabilities.





# Ultimate music Mac



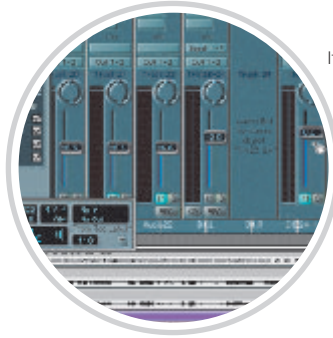
Most music and audio software require two large windows for editing and mixing. Ideally, the editing and the mixing windows need to be visible at all times – so you need two monitors. For looks and space, we recommend two **17-inch LCD Apple Studio Displays** (£699 each). You'll also need to buy a **DVIator** (about £169) cable and DVI video card, such as ATI's £179 **Radeon** (both from 020 8400 1234).



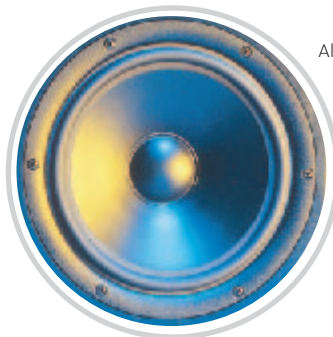
Digidesign's **Pro Tools** (01753 653 322) is the leading system for recording audio and MIDI onto your Mac. A basic Pro Tools Mix system will set you back £5,989. This includes one Mix card to provide mixing, signal processing and audio I/O, along with the Pro Tools 5.1 software. If you have the budget, then go for a **Mix+** at £7,479, or a **Mix 3+** at £8,979. These include two or three DSP cards rather than the basic one-card system – so you're paying around £1,500 per additional card. Additional Mix cards bought separately cost £2,898. Why not go the whole hog and add a **Control|24** (pictured) for another £5,989. This control surface boasts real faders and knobs, from Focusrite (01494 462 246).



You'll also need one or more audio interfaces, such as the standard **Digidesign 888|24** (01753 653 322) that provides eight digital and eight analogue I/O channels for £2,769. The **Apogee AD8000** costs around £3,995 depending on fitted options (07946 498 144), and offers many advantages over the basic 888|24. For the ultimate system, the best-sounding interface you can buy is the £5,945 **ADA8**, which is available from Prism Sound (01223 424 988).



If you need to record lots of MIDI, you'll want to add a MIDI + Audio sequencer to your system. Emagic's £467 **Logic Audio Platinum** (01462 480 000) is the most popular choice to use with Pro Tools hardware. You'll also find stereo editing software useful. We recommend the £424 **TC|Works Spark XL** (0800 917 8926) or £297 **BIAS Peak** (020 7923 1892).



All this stuff without a set of top-notch speakers would be rather silly. So go for **ATC SCM20 Active Monitors** at £2,887. These are the best nearfield monitors money can buy (01285 760 561). You'll save some cash with a £1,956 pair of **Genelec 1031A** speakers (020 7923 1892), which use eight-inch speakers in compact cabinets – ideal for smaller setups and conveniently sized for positioning as nearfields.



## 533MHz DP Power Mac G4

Even with a Pro Tools MIX system installed – which has its own DSP chips – there are many other third-party applications that you may wish to run that use the computer's CPU for processing. The dual-processor Power Mac G4's second processor takes care of signal processing and synthesis, while the main processor handles the user interface and other operations. At press time, £1,799 buys the 533MHz DP G4 with 128MB RAM, a 40GB hard drive and a CD-RW drive. Add at least another 256MB of RAM for about £60.

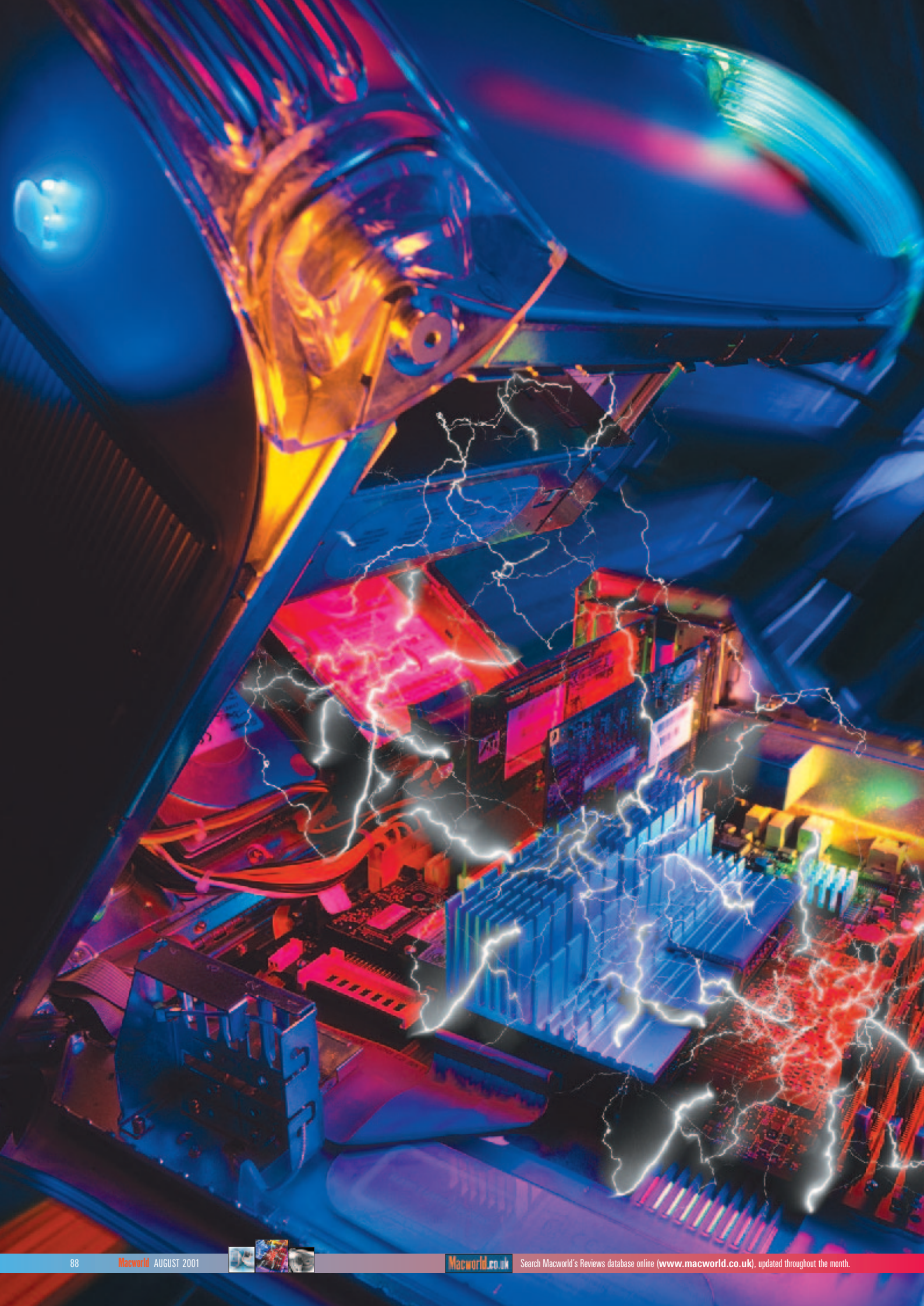
Although the internal UltraATA hard drive is fast enough to record audio, it's better to use a SCSI drive with a 10,000rpm drive and a fast SCSI card. Check Digidesign's list of qualified drives and SCSI cards on [www.digidesign.com](http://www.digidesign.com). If you buy your Power Mac from Apple's online Store, you can add up to three fast internal SCSI drives (from £1,116 extra). Back-up to 9GB DVD-RAM discs – try LaCie's £499 9.4GB FireWire DVD-RAM drive; 9GB discs cost £39 each (020 7872 8000).



Top singers and instrumentalists use Neumann microphones, such as the **Neumann M147** at £1,100 (01494 551 551). For £2,700 the **Neumann M149** uses the same capsule as the M147, but has a full selection of alternative polar patterns to suit different situations.

For recording in stereo, add a pair of **AKG C414s** at £680 each (020 8202 1199). To connect microphones to Pro Tools interfaces, you need microphone pre-amplifiers (unless you have an external mixer containing these). The **Focusrite Red 1** provides four of these in a rack for £1,925 (01494 462 246). **MW**





# Does MHz matter?

Before you buy or upgrade, find out what really affects your Mac's performance.

By Jonathan Seff

**S**peed. Whether you need a new Mac that'll give you more of it or you want to wring as much as possible from the machine you've got, speed is what it's all about. If you've ever waited and waited for a Microsoft Excel calculation to finish or for an Adobe Photoshop filter to appear, pixel... by ...pixel, you know what we're talking about.

It's easy to look at the clock speed of a Mac's processor — measured in megahertz — as the prime indicator of the computer's speed. But your hard drive, your RAM, your video card, and many other parts of your Mac also affect its speed.

That MHz number in your Mac's name does matter — but it's far from the only factor. To gauge how different components can optimize a system's performance, we enlisted the expertise of Macworld Lab. When you see what we found, you'll never look at MHz the same way again.

## Quest for speed

Your processor can be thought of as your Mac's brain, but a lot of other hardware inside your computer helps to process and transfer information. Each piece can significantly affect your system's overall speed. (See "Your Mac's inner life" for how everything works together.)

Your Mac can read and write data much faster to RAM than to your hard drive, so the more RAM you have, the more data your Mac can keep at the ready. Photoshop, for example, places into RAM as much information as possible about the images it's editing. When there's no more real memory available, the rest of the data is stored on the hard drive. If you've ever edited a large image in Photoshop on a system with very little RAM, you know that when the hard drive comes into play, you must sit and wait.

Though the hard drive can't move data as quickly as RAM, it still has the ability to affect performance in a major way. Regardless of its size, a faster hard drive will certainly speed up your work when memory-intensive applications such as Photoshop run out of RAM and begin storing data on the disk. And many applications — FileMaker is one

example — spend most of their time reading and writing data on the hard drive.

Then there's the video card, which dramatically affects image-intensive features such as scrolling speeds, screen redraws, and the frame rates of 3D action games.

Which of these subsystems are most vital for you to consider when you're shopping for a new system or upgrading your current one? The answer depends on how you use your Mac.

## The processor

The Mac Classic II that Apple sold ten years ago had a 16MHz processor. Today's fastest Power Mac G4s run at 733MHz. But does multiplying megahertz by 45 really mean 45 times the speed? When is an incremental boost in processor speed worth its price? When is a dual-processor system a prudent choice?

To analyze the power of the processor, Macworld Lab tested several models: single- and dual-processor 533MHz Power Mac G4s; a single-processor 733MHz Power Mac G4; and a 450MHz blue-&-white Power Mac G3, with and without a PowerLogix G4 upgrade card.

**Basic tasks** For most basic tasks, such as starting up your Mac and using the Finder, a faster processor won't gain you anything. However, for a few basic, processor-intensive tasks, you do benefit: unstuffing a file in our trials went 7 per cent faster on the 733MHz G4 than on the 533MHz G4, and encrypting a file using Apple's Encrypt command was about 12 per cent faster. (See our test results in "Variations on a Mac.")

In Microsoft Office tests, the power of a faster processor was evident — the 733MHz G4 beat the 533MHz model in all five of those tests. Most impressive: the faster processor was worth a 21 per cent edge in scrolling through an Excel document.

**Graphics and media** When it came to Photoshop, the 733MHz Power Mac was only negligibly faster at most of

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“The more RAM you have installed, the more Data your Mac can keep at the ready.”

the tasks than the 533MHz system (see “Putting Photoshop to the test”). Where the processor speed really seemed to make a difference, however, was when we converted an RGB image to the CMYK colour space. The 733MHz Mac did the task 30 per cent faster.

Audio and video applications also demand processor power – as our MP3 and video-export tests demonstrated.

Games can also be very processor-intensive. In our Quake III tests, the 733MHz system displayed 14 per cent more frames per second than the 533MHz machine. The result was more-fluid game animations and a far more enjoyable gaming experience.

**The dual-processor difference** Macintosh users can once again choose a computer with two processors.

In Mac OS 9, an application that is written to take advantage of both processors (such as Photoshop) can spin off tasks to the second processor. In Mac OS X, applications native to OS X can run on either processor, and tasks use the processors more equally.

In our tests, the dual-processor 533MHz model showed its best results, predictably, in Photoshop. In four of six tests, the dual-processor system beat its single-processor cousin, shaving more than 20 per cent off the time needed to complete a Gaussian blur, for example.

The 3D application Cinema 4D XL, from Maxon (see reviews, page 50), also takes advantage of multiple processors. When rendering a model – a very processor-intensive task – the dual-processor Mac cut nearly half off the time of the single-processor 533MHz machine, and it cut more than a third off the 733MHz Mac’s time.

In tests of software not optimized for multiple processors, however, the dual-processor Mac offered little or no advantage.

**G3 versus G4** Another choice you have as a Macintosh user is between the G3 processor used in Apple’s consumer systems (the iMac and iBook) and the G4 processor used everywhere else. The two are very similar, except for AltiVec – Apple calls it Velocity Engine – on the G4. It gives G4-savvy applications (Photoshop is one) an extra boost in speed.

We explored the differences between the G3 and G4 by pitting a 450MHz blue-&-white Power Mac G3 system against itself – with a 450MHz G4 upgrade card inside.

The two configurations were neck-and-neck in most Finder and Office tests; however, the G4 chip came through on features designed to take advantage of AltiVec. Our upgraded G4 system performed a Gaussian blur in Photoshop in half the time it took the original system, and it also rendered lighting effects faster. In MP3 encoding, the

upgraded system shaved 36 per cent off the G3’s time.

**The bottom line** Just look at the difference between similarly configured Power Mac G4s, one running at 533MHz, the other at 733MHz: the latter model has a clock speed nearly 40 per cent faster (and at press time, it cost £500 more). Yet in most of our tests, it provided a less-than 10-per cent improvement, and in only a handful did it make a difference of 20 per cent or more.

Faster or multiple processors generally mean faster computers, but the difference won’t matter much unless you spend most of your time in a 3D, graphics, or video-editing application. Even then, RAM might give you more bang for your buck. If you do a lot of work with graphics, the horsepower of a faster processor will help, but an extra processor will help even more – if the applications you use are multiprocessor-aware, and especially if you’re using Mac OS X.

## RAM

The more RAM you have, the more information you can store there. That means fewer trips to your relatively slow hard drive. And although RAM prices fluctuate, lately they’ve been as low as prices on the stock market. So when does adding RAM make sense? To find out, we retested our 533MHz G4 after increasing its puny 128MB of RAM to a total of 768MB.

**Basic tasks** In most general-use areas, adding RAM to our test systems made little difference. However, it’s important to note that the more RAM you have, the more applications you can run simultaneously. That’s not technically a speed gain, but being able to switch between open applications instead of having to quit some before launching others certainly helps productivity.

Mac OS also offers built-in virtual memory; turning it on sets aside part of your hard drive to be used as memory when your RAM fills up. But hard drives are slower than RAM. If you rely on virtual memory to keep all your favourite applications open, adding RAM instead will dramatically improve your system’s responsiveness.

**Graphics and media** In Photoshop work, you manipulate a lot of information. Every time you run a filter, that filter must analyze and modify every last pixel of your image. The more image information you can keep in RAM, the faster Photoshop runs.

So when we added 640MB of RAM to our test system, Photoshop began to fly. Rotating and applying lighting effects to an image went twice as fast as they did on the original 128MB system. The extra RAM tripled the system’s

scores in the Gaussian Blur and Unsharp Mask tests. And resizing an image was four times faster with the extra RAM.

Outside of Photoshop, additional RAM didn’t make much difference in test results. The system’s performance in our iMovie test was slightly better with the additional memory, but scores in our Cinema 4D XL, SoundJam, and Quake tests were essentially unchanged.

**Dual processors** We also added RAM to our dual-processor 533MHz and single-processor 733MHz Power Mac G4s, and we tested them with Photoshop. The result was an impressive display of Apple’s dual-processor technology: the dual-processor system was clearly faster than the 733MHz system in four of our six tests.

Massive amounts of RAM and two G4 processors are the most potent combination any Photoshop professional could want.

**The bottom line** If you’re a Photoshop pro, RAM is where it’s at. We saw tremendous gains when we added memory, especially on the dual-processor G4. If Photoshop is not your main application, more RAM won’t bring huge speed gains, but it can help if you run many applications simultaneously or rely on virtual memory.

## The hard drive

Writing to or from a hard drive has traditionally been a performance bottleneck for Macs. Processors had to wait around for slow hard drives to provide them with data. The sure-fire way to speed up a Mac II was to buy a speedy new hard drive.

We tested three hard drive configurations in our 533MHz G4: its built-in 7,200-rpm Maxtor ATA-100 drive; a slower 5,400-rpm Western Digital ATA-66 drive; and a RAID array with two 36GB Seagate 10,000-rpm drives connected via Adaptec’s 39160 Ultra 160 SCSI card.

**Basic tasks** The 5,400-rpm drive and 7,200-rpm drive were evenly matched in most of our Finder tests, but the RAID array was clearly faster than either. With this configuration, our system duplicated a 100MB test file in just over half the time it took the other drives.

**Graphics and media** Photoshop likes lots of RAM, but once it runs out, it has to write data to the disk – and the faster the hard drive, the better. The RAID array had the fastest times, beating our 7,200-rpm drive on nearly every front. Resizing an image went nearly 40 per cent faster on the RAID system. The 5,400-rpm drive was dead last in all our tests.

**The bottom line** For most common tasks, the speed of your hard drive won’t make much difference. As our testing

showed, a hard drive’s effect is most apparent in disk-intensive programs such as Photoshop.

The advantage of a faster drive applies most to capturing and editing digital video and audio – tasks that involve gigantic amounts of data.

For example, if you’re a musician, you’ll want a speedy drive so you can simultaneously play back multiple audio tracks.

But the cost of our high-end RAID system (an extra £1,200 for a SCSI card plus two 10,000-rpm drives) makes it a serious investment for a graphics professional. Before you buy such a drive, consider adding a lot of RAM and a faster processor instead.

## The video card

A Mac’s video card draws everything you see on its monitor. Today’s video cards are blazing fast, and most are designed to draw complicated graphics, such as the 3D graphics in cutting-edge games, as fast as possible. To see how different video cards affected performance, we tested the G4/533 with its installed ATI Radeon AGP card and with a Rage 128 Pro AGP. (We also tried it with a Radeon PCI card.)

**Basic tasks** Most of these results weren’t affected by the change in video cards. But for scrolling – which relies heavily on the power of your video card – the faster Radeon card clearly outperformed the Rage 128 Pro. The Radeon was 10 per cent faster at scrolling a PDF file and 12 per cent faster at scrolling in Excel.

**Graphics and media** The Radeon has more RAM and is newer than the Rage 128 Pro, and that hit home in our gaming tests. In our Quake test, the Rage 128 Pro drew about 40 frames per second, compared with Radeon’s 59 frames, which made for noticeably smoother game play.

**The bottom line** A better graphics card will speed up scrolling and support monitors with higher resolutions. If you are a graphics professional, improved scrolling speeds will save you some time. But the best reason to upgrade your video card is to play games on your Mac.

## Other factors

Several other things also affect performance. You can’t upgrade your system bus, and most people won’t upgrade their DVD- or CD-ROM drives, but each of these has a bearing on a Mac’s speed.

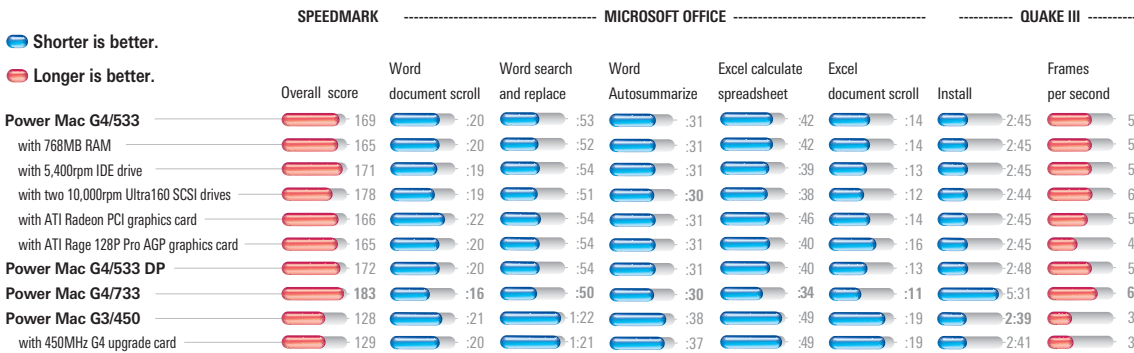
**System bus** A bus is a line of communication between your Mac’s components. The system bus connects the

“For a Photoshop professional, massive amounts of RAM and two G4 processors are a very potent duo.”

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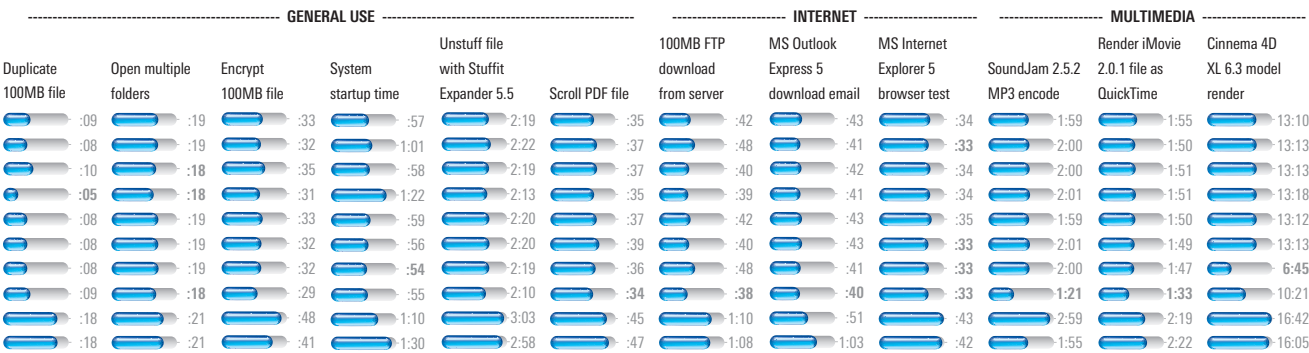
# Variations on a Mac

We chose one Mac system as our primary guinea pig: a Power Mac G4/533 with 128MB of RAM, a 7,200rpm Maxtor internal hard drive, an ATI Radeon AGP graphics card, and Mac OS 9.1 installed.



Speedmark scores are relative to those of a 350MHz iMac (1999), which is assigned a score of 100. Quake frame-rate scores are in frames per second; all other scores are in minutes:seconds.

We then varied components to see how each part affected overall speed. We also tested a Power Mac G4/733; a dual-processor G4/533; and a G3/450, with and without a 450MHz G4 upgrade card.



See [www.macworld.co.uk/speedmark](http://www.macworld.co.uk/speedmark). Macworld Lab testing by Jason Cox and James Galbraith.



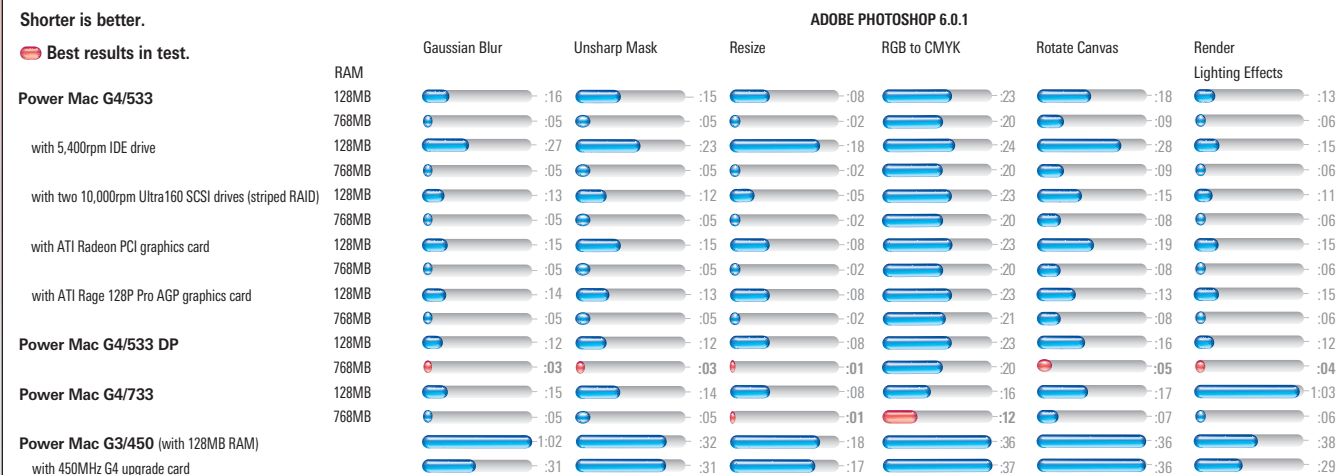


## Putting Photoshop to the test

Few applications expose a Mac's deficiencies better than Adobe Photoshop. We ran a series of Photoshop tests on each of our various Mac configurations. Since RAM is a major factor in Photoshop performance, we tested each system twice – once with 128MB of RAM, and a second time with 768MB.

Shorter is better.

Best results in test.



All scores are in minutes:seconds. We used a 50MB file, and tested each system with a default system disk cache, virtual memory disabled, and displays set to 24-bit colour and 1,024-x-768-pixel resolution.

We set Photoshop History to Minimum. In tests with 768MB of RAM, we set Photoshop's memory partition to 250MB; with 128MB of RAM, we set it to 75MB. – Macworld Lab testing by Jason Cox and James Galbraith.

processor to the RAM. Essentially, the faster your Mac's system bus, the faster your Mac's processor can work.

The latest Power Mac G4s feature a system bus that runs at 133MHz. The system bus on the PowerBook G4, G4 Cube, and iMac runs at 100MHz. iBooks have a slower 66MHz system bus.

**Optical drives** A major quirk our tests revealed was that the 733MHz G4 took twice as long as our 533MHz G4 to install Quake from a CD. That's because the 733MHz model we tested uses Apple's new DVD-writing SuperDrive, which reads CD-ROMs much more slowly than the CD-R drive in the 533MHz G4.

### The last word

Processor speeds measured in hundreds of megahertz are flashy, easy-to-compare numbers, but they don't tell the

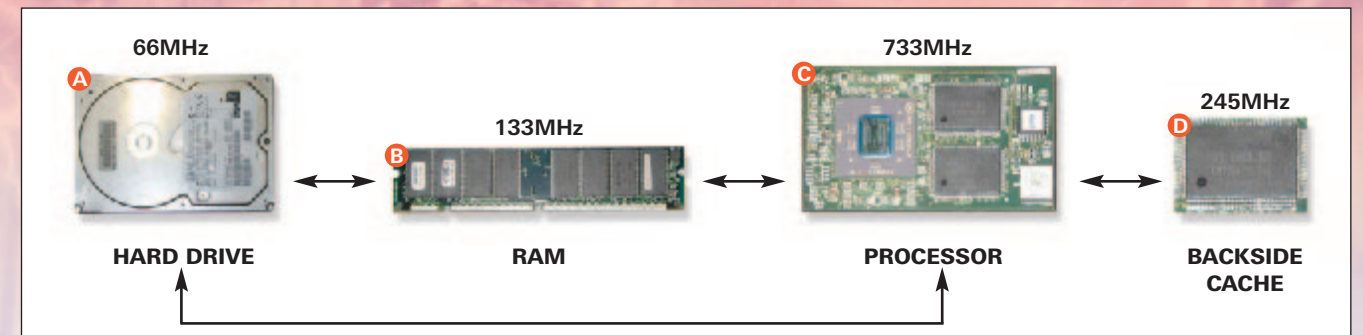
whole story. Your Mac's other components also have a lot to do with how fast it runs.

How you use your Mac on an everyday basis will determine which components mean the most to you. If you need to move large chunks of data – Photoshop pros, take note – loading up on RAM will generally do you more good than superfast hard drives and hyperclocked processors. Faster processors generally make for faster Macs, but they aren't good investments unless you spend a lot of time with processor-intensive 2D, 3D, or video applications. And if you're a gamer, spend some cash on a better video card and watch frame rates skyrocket along with your scores.

Whether you're shopping for a new Mac or just trying to squeeze more life out of your current system, look beyond megahertz: it will help you make a much-wiser hardware investment.

together to run your applications. Some execution units do the actual computations that result in Microsoft Excel calculations or Adobe Photoshop blurs, for example. Others figure out which instructions to follow next and coordinate efforts among the execution units. Still others are responsible for connecting the processor to the outside world – allowing the processor to talk to the motherboard and its physical components.

All these components on a processor work in lockstep, based on the processor clock, which sets its internal rhythm. The clock is a metronome that synchronizes the workings of all the different execution units – some units may take five beats, others three, and so on. The clock's speed is described in terms of MHz (megahertz), or millions of cycles per second. For example, the processor clock of a 733MHz G4 processor "ticks" 733 million times a second.



To open a file – eg. a Photoshop image – your processor (C) tells your hard drive (A) to send those bits of data into RAM (B). To apply a blur filter, a pixel-by-pixel operation that repeats the same instruction set over and over, the processor grabs the image from RAM and then stores the reusable code in the much faster backside cache (D). After going back and forth between the speedy processor and backside cache, the processed data is dumped back into RAM and sent to the hard drive.

Even a state-of-the-art processor such as the PowerPC G4 isn't all-powerful. It doesn't normally issue direct commands to the Mac's other components – say, telling your monitor to draw a letter on the screen. A processor usually just reads data sitting in your Mac's RAM, manipulates that data (based on the instructions given by your software), and writes the results back into RAM. Endless variations of these steps, coupled with the movement of finished work from RAM to the hard drive or the monitor, result in the productive Mac you know so well.

### The motherboard

The motherboard provides physical connections and power for all of the components on it, which are numerous: RAM, processors, ROM chips, modems, AirPort cards, power controllers, PCI and AGP card slots, ATA and IDE connectors for peripherals such as hard disks and CD/DVD drives, and external connectors for audio, USB, FireWire, and ethernet.

But the motherboard is more than a power socket and hardware organizer. As the conduit for communication between your Mac's many systems, it allows the processor to send its commands to the other components, and it lets those components communicate with the processor and each other. Your processor tells the IDE controller on the motherboard what data to burn in your CD-RW, for example, and that controller manages the burning process.

### Lines of communication

Of all the tasks your Mac's motherboard must perform, perhaps the most difficult is allowing all your Mac's parts – which run at different speeds – to communicate with one another. The lines of communication are called buses, and each has its own clock speed (measured in MHz) and width (how many bits of data it can transmit in one tick of the clock).

Every motherboard has bridges that act as go-betweens for the many different buses. Most of the Mac's peripheral systems – USB, FireWire, and IDE, to name a few – are connected to the PCI bus, which runs much more slowly than the system bus (the processor and the memory). Data from the Mac's slower components (such as the hard drive) travels across the PCI bus and from there via bridge to RAM.

Thanks to the bridges, the processor is more efficient – it rarely has to waste ticks of the clock waiting on a slow component. The processor can fire commands off to a bridge and then move along to another task. For example, the processor can send a block of data to the video card, and the video card can collect the data later, when it is ready, all because the bridge is acting as the conduit. Many of the components on the motherboard have their own RAM for collecting data before it is sent to or received from the processor in one efficient burst.

### Caches

In an efficiently running Mac, the processor is working on something all the time. If the processor has to wait idly for data to arrive from RAM, that inefficiency will translate to a slowdown. The only way to ensure that the processor is always busy is to have all the RAM run at the same speed as the processor. Unfortunately, equipping all Macs with such speedy RAM would be much too expensive – and that's where cache RAM comes in.

The 733MHz Power Mac G4 processor operates five-and-a-half times faster than the Mac's 133MHz RAM, yet the machine is incredibly efficient. This is accomplished with a backside cache.

The frontside bus is the channel between the processor and the main memory, but that bus is slow. So, engineers created a special backside bus that runs only between the processor and the cache, a small amount of memory manufactured to run many times faster than normal RAM.

Backside caches improve performance in a very elegant way. Your Mac's processor receives repeated commands and data about 90 per cent of the time. Storing that info in an ultrafast cache reduces the number of times your Mac must read from the motherboard's slower RAM.

Sooner or later, the processor will need something from main memory that isn't in the cache – called a cache miss. When this happens, the processor retrieves what it needs from the RAM on the motherboard.

The latest Power Mac G4s have three layers, or levels, of backside cache. Level one (or L1) cache, is built into the processor itself. It contains 32K worth of cached instructions for the processor, and 32K of data that the processor will use to execute those instructions. The L1 cache, which runs at the same speed as the processor, contains the stuff your processor will work on during the next few nanoseconds.

Since the introduction of the G3, PowerPC Macs have also had an L2 cache, which tends to run a bit slower than the processor, but because it's connected directly to the processor, it still runs much faster than system RAM. On current G4 Macs, the L2 cache has been integrated into the processor itself.

However, these Macs have been bolstered with even more cache – an L3 cache that runs at one third of the processor's speed. That may sound a bit poky, but using the L3 cache is more efficient than retrieving information from RAM on the motherboard.

### Working together

All of your Mac's subsystems work in unison to assist the processor in running more efficiently, with the motherboard serving as the great negotiator and communicator among them all. Yes, the processor is a critical component, but it's only one element of your Mac's complex inner life.

“An efficiently running Mac is one in which the processor is working on something all of the time.”

# Your Mac's inner life explained

A lot more goes on inside your Mac than you know. Take a peek.

The inside of your Mac is complicated: in addition to your processor, RAM, and hard drive, there are dozens of subprocessors and controllers that ensure smooth operation. The great unsung hero of your Mac is the motherboard – the large circuit-card platter that houses, powers, and allows communications among all the components. See the top of the page opposite.

### The processor

Most basically, computers take in data, manipulate it, and then either output the result or store it for you to work on later. The part of your Mac responsible for the most important step – the manipulation of data – is the processor, your Mac's "brain".

A processor isn't a monolithic calculation machine. Rather, it's made up of many execution units working







# Maya oh my

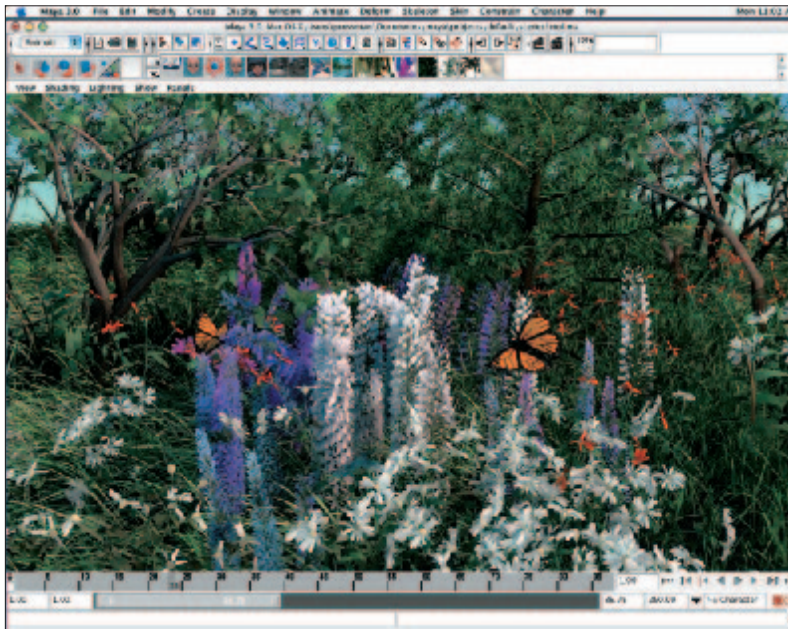
The 3D-graphics leviathan Maya is set to bring the world of Hollywood special effects to Mac OS X.

By Simon Danaher

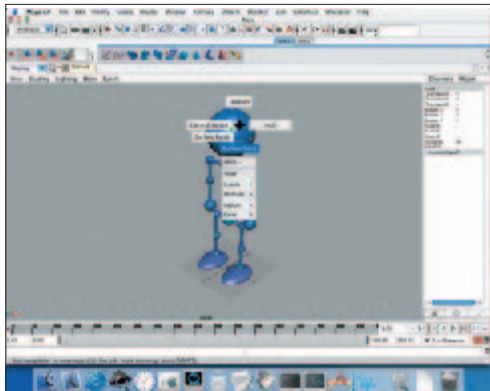
**M**ac OS X will usher in a new era for Macs, in which the platform is no longer a second-class citizen in the world of 3D graphics. Traditionally, it has been Windows NT, Linux or SGI Irix systems that 3D-graphics pros preferred for high-end production. But the introduction of Mac OS X means that there is now a compelling alternative to Wintel boxes and high-priced SGI workstations for 3D graphics production. OS X is the perfect amalgam of Unix power – with which high-end 3D gurus are familiar – and ease of use, for which the Mac has always been famed. There's something else too: Maya (pronounced "mire"), the most powerful 3D-graphics package on the planet, is coming to Mac OS X.

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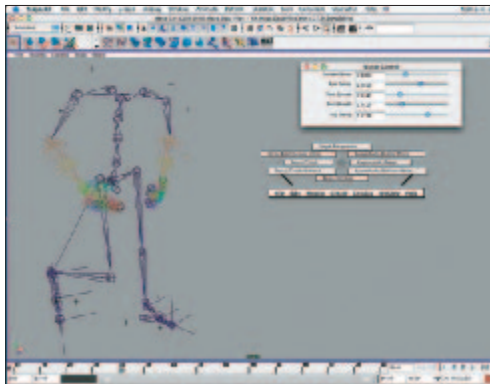




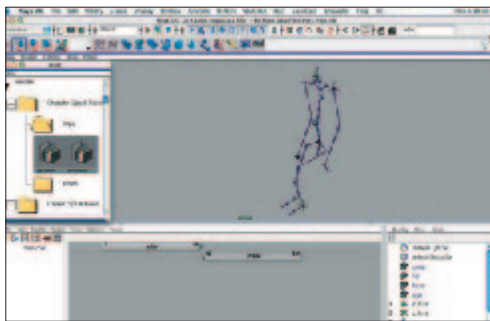
**Flower power**  
Maya's Paint Effects is a special technology that can be used to paint complex 3D geometry into a scene. This render is made entirely of Paint Effects objects, which not only interact with standard 3D elements but are animated, too.



**Time saver**  
Marking menus is one of Maya's many interface shortcuts. These contextual menus follow the Aqua scheme on Maya for OS X complete with transparency.



**Customized care**  
Maya allows for the creation of custom interface-elements, giving instant control. The panel on the right has sliders for controlling the skeleton – such as Arm Swing, Foot Spread and Hip Swing.



**On Trax**  
Maya's Trax editor gives character animators the ability to blend animation 'clips' of a single character, mimicking the way video editing works.

For those who don't know, Maya is the Photoshop of 3D graphics. In its relatively short history it has become the undisputed heavyweight 3D champion. It has been used in Hollywood feature films for special effects and character animation, and has enabled 3D artists to push the envelope of what's possible in terms of 3D animation. An example of just what Maya can do can be seen in the up-and-coming all-Maya movie, Final Fantasy ([www.apple.com/trailers/columbia/final\\_fantasy](http://www.apple.com/trailers/columbia/final_fantasy)). The fact that a version for Mac OS X is imminent speaks volumes about how the 3D industry has changed its opinion of the Mac. No longer is it the humble desktop machine useful for some 2D work, but not much else. Now, it's a fully-fledged 3D powerhouse capable of running heavyweight 3D programs like a dream.

So why was the Mac largely snubbed by 3D pros? It wasn't because of its usability (it's been the desktop of choice for creatives for an eternity), but rather due to its operating system. The old non-Unix based Mac OS was considered too flaky for production-critical 3D animation applications. High-end 3D programs, such as Pixar's Photorealistic Renderman and Avid's Softimage 3D, have been film-effects market leaders for years, but neither has ever become established on the Mac. A version of Photoreal Renderman, called MacRenderman, ported to the Mac a number of years ago, but support was dropped and the program died a death.

The fact is 3D-production artists have largely used Unix or Windows boxes. This is not to say that there have been no powerful 3D programs available to Macintosh users. Lightwave, Cinema 4D XL and ElectricImage are examples of successful mid-range 3D animation programs that can run on a Mac. In fact, until recently, ElectricImage was Mac-only. However 'high-end' animation has never been a Mac thing, despite many 3D artists using Macs at home.

Alias|Wavefront's announcement that it is shipping an OS X version of Maya in September sent shockwaves (no pun intended) through the 3D industry – and many other applications are likely to follow Maya's lead. Though still speculation, Pixar's Photoreal Renderman software is touted to be heading for the Mac, because it and Maya are companion products. That Steve Jobs is CEO of Pixar may also have a bearing on the matter.

## Now that's magic

Maya is named after the Hindu goddess of illusion, and is a 3D system that unites different technologies, such as NURBS, polygonal modelling, advanced rendering, animation and dynamics – all in a single, integrated package. The sales pitch for Maya may as well be that it's the only 3D program you'll ever need.

NURBS (non-uniform rational B-spline) are mathematical descriptions of surfaces that are perfect for describing smooth curves and flowing lines. The NURBS modelling in Maya is considered by 3D professionals to be the best around. A powerful feature is Maya's Construction History, whereby the steps taken in creating a model are stored in a list that's continually evaluated. Make a change to any part of the history and it's immediately reflected in the final object. Construction history can be applied to both NURBS and polygon models, and is a core feature.

Maya's architecture is based on 'nodes'. These are basic Maya components that have an input and an output value. Much of Maya's power comes from the fact that you can connect these nodes to form more complex node-networks. A simple NURBS sphere, for example, consists of a number of different types of node: there's a transform node, that defines the sphere's location and orientation; a shape node, that defines the sphere's geometry; and a material node, allowing the sphere to be viewed and rendered. In Maya, all content is in node form, meaning you can connect more or less anything to anything else – providing a massive degree of flexibility, as well as limitless functionality.

## Pal MEL

Another powerful Maya feature is its built-in programming language, MEL (Maya Embedded Language). Portions of Maya are themselves built using MEL, so it's more than for just creating scripts and macros. This means high-end users can customize Maya on a job-by-job basis; if the core toolset isn't quite up to the job, then a bespoke MEL program certainly will be.

A MEL script could be used, for example, to integrate Maya with another program used by your company. Or, it could be made to organize scenery data in a specific way. Even users that can't write MEL scripts can make use of MEL – as the Script editor lists all commands that have been used in a Maya session, so you can select the command, or series of commands, for just-performed actions. This text can then be drag-&-dropped as a button on a part of the Maya interface called the Shelf. Just click the button, and the script is executed – repeating a procedure in a couple of seconds than might otherwise have taken minutes.

The great thing about MEL is that users can share their scripts, knowing others will be able to run them without a problem. There's already a large third-party community sharing MEL scripts, and, because MEL works inside Maya, it's platform-independent. This means Macintosh users will have access to a huge library of extra features.

MEL can be used to control the Maya interface, too. Once a character is set up, users can create custom interface-elements to control various parameters of that character. If, say, you're playing an animation of a person walking, a slider can be used to change the character's gait, make the arms swing more, make him bow-legged – anything you like.

## Special effects

Maya OS X also features the Full Dynamics system. Used to create the famous Pod Race from *Star Wars Episode 1*, it's an incredible system that combines particles and both rigid-body and soft-body dynamics.

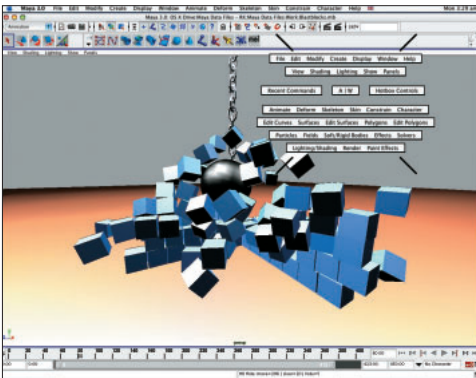
Rigid bodies are objects that react to forces and collisions without deforming. A classic example would be pins being struck by a bowling ball. Maya can calculate this sort of scene without much difficulty. It was the rigid-body system that was used to create the spectacular crashes of the pod racers. The scenes were created by the George Lucas-owned ILM (Industrial Light and Magic) using highly detailed 3D pod-racer models each, built of individual elements that flew apart and exploded when the dynamics system was run. Soft-body dynamics are used to simulate objects that deform when forces are applied to them – so a simple 2D NURBS plane can be transformed into anything from a billowing flag to a table cloth. By adding forces in the scene, such as Gravity and Turbulence – and defining collision objects for the soft bodies – realistic motions of deforming objects can be produced.

## Clean sweep

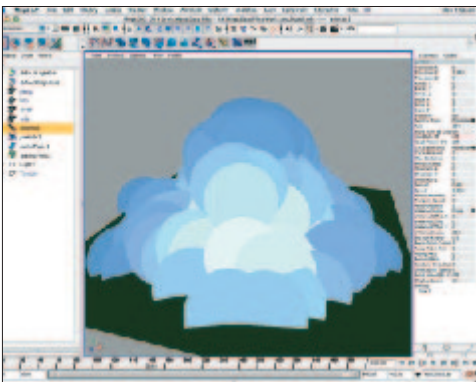
Another key component of Maya is its brush-based suite of tools, called Artisan. These tools all use the same paint-based paradigm. The most obvious use is for painting textures onto objects, which can be done directly in the Maya workspace. But it goes further, adding "deforming geometry", by adjusting both weights and vertices for particles. Weight painting is a useful feature, because it allows for control over dynamics by simply painting values – displayed as greyscale values – on the object. Real-time feedback of the changes provide a flow of information about the attributes being controlled.

As one would expect, animation is an area well catered for in Maya. Keyframing is the application's prime animation device, though there are also the dynamics mentioned above. Keyframing is the process of assigning values to parameters at specific moments in time – that is,

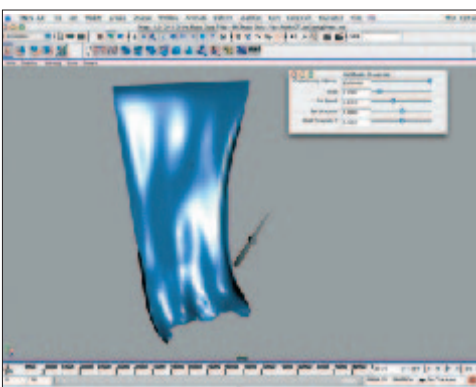
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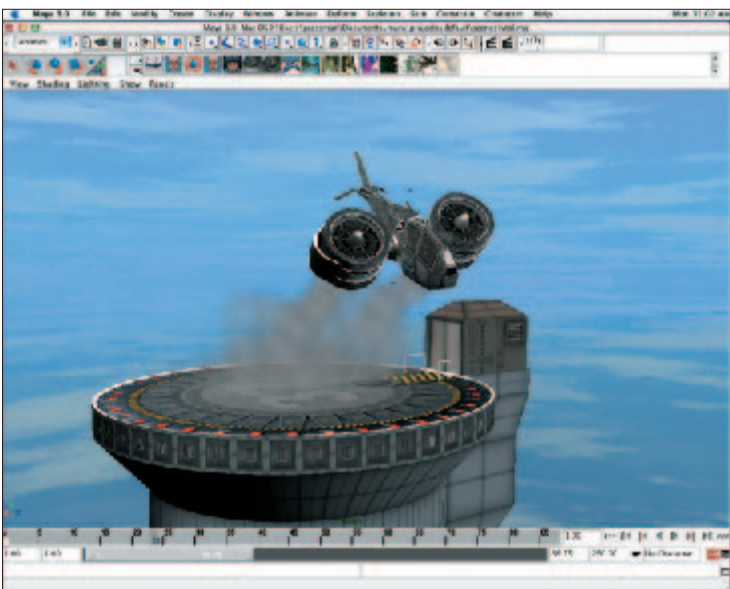
**Rigid outlook**  
Rigid-body dynamics are used to calculate the interaction between solid objects and forces, such as mass, friction and gravity. Collisions between objects are calculated automatically by Maya, as you can see in this scene.



**Particle physics**  
Particles can be rendered using hardware shading, or with the software renderer. This preview shows a 'blobby' particle system pouring from an emitter.



**Body beautiful**  
Maya's Softbody dynamics allows for shapes, such as this cloth-like object to interact with forces – here, Wind and Gravity – making it billow as if it were real cloth.



**Game on**  
Maya has become a major player in games production, and it's easy to see why. Its Polygon tools are well suited to games design, and Alias has paid particular attention to the UV-texturing tools. This image was rendered in real time on a Mac G4 733 using an ATI Radeon graphics card.





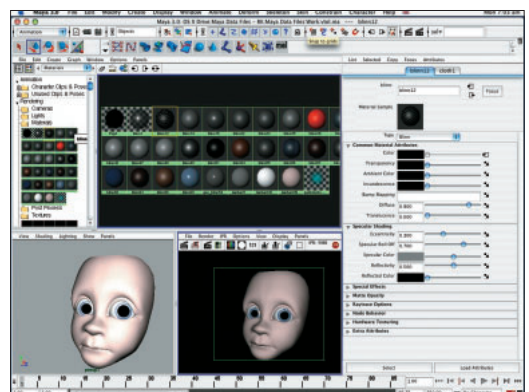
### Graphics powerhouse

Maya's 3D view is capable of delivering very fast OpenGL-accelerated graphics, even at high resolutions. With OpenGL supported natively on Mac OS X, Maya's performance in this area is assured.



### Facing facts

Maya's powerful animation tools give character animators free reign. This is a Blend Shape control window, used to animate the character's facial expressions. Each of the sliders represent a facial pose, and the animator can create different real-time expressions by adjusting the level of each slider.



### Material whirl

Hypershade mode is Maya's texturing environment, in which artists can build shaders from a vast array of texture and material nodes.

to specific frames in an animated sequence. It is used for transformation-affects in shape, light or how the "camera" captures a scene. Maya's keyframing functionality is underpinned by a management tool called Trax.

Unlike traditional keyframing found in other animation programs for the Mac, Trax is a non-linear animation system. It works by blending multiple Clips, which are self-contained packets of animation data. The user first has to keyframe an object, save that animation as a clip, and then store it. One clip might involve a character running, another showing someone jumping, and yet another featuring a person crawling. Using Trax, you can load all of the clips in an editor and segue neatly between them. The run will blend into a jump, which in turn becomes a crawl. It makes animation more like video editing, an approach many Macintosh users will be familiar with.

### Render splendour

Maya's rendering system is also very powerful. Two features stand out, because of their lack of comparison on the Mac. The first is Hypershade, which is used to create materials for Maya objects. Unlike with other programs, you create materials from scratch using material nodes. Maya supplies a series of base material-nodes into which you can plug various utility and texture nodes. The animator can plug a fractal noise-shader into the Bump input of the material to create a bumpy fractal surface. This can then be connected to the Colour-input channel to colour the surface based on the same fractal pattern.

Hypershade displays each of the nodes as swatches, offering preview renders of output. Within this system, it's possible to build huge shader 'trees'—so-called as they have a branching structure of connections leading to the base material. Shaders for any kind of surface material can be created, though the process can be extremely intricate.

### The final word

There are three versions of Maya. Maya Unlimited (£13,560) is the full and very expensive version that includes Fur rendering, clothing simulation, camera matching (for integrating 3D into live action footage), and advanced modelling, in the form of Subdivision Surfaces. Maya Complete (£6,360) is the base version, which has the core tools (dynamics, NURBS, Artisan, Trax etc), but lacks the advanced features of Unlimited. A third version, Maya Builder (£2,580) is a cut-down version of the package designed for games-level design.

The version currently in development for OS X is Maya Complete. However, Alias|Wavefront has indicated that an OS X version of Complete will boast additional features unavailable on the other platforms, such as tear-off menus in the Hot-Box, Maya's contextual-menus system. Also, the initial release for the Mac will be version 3 of Maya Complete — even though the current version of Maya for Windows and Irix is Maya 4. However, with the extra Mac features, Alias|Wavefront may as well call the release version 3.5 for the Mac. The company's intention is to bring all platform versions into line at some point after the initial release of Maya for OS X, so there's no worries about the Mac being left behind.

Maya for OS X is a watershed for Apple; it marks the coming of age of the Mac and its return to glory in professional graphics.



IMAGE BY KIND PERMISSION OF MAYA





# High-tech home: wired or wireless?

**Y**ou can wirelessly access your blazing Internet connection or inkjet printer from any computer in your home, participate in adrenaline-soaked bloodbaths via householdwide multiplayer games, and even stream MP3 files to your stereo. And a slew of new home-networking products and technologies make connecting your computers easier and more affordable than ever. Now is the time for us to build tomorrow's network.

UK homes are set to pick-up networking as fast as they are in the US. Although only 2.5 million US households were networked at the end of 2000, that's nearly four times more homes than the year before.

**Wired versus wireless** The first and most important step in shaping your network is choosing which type will best suit your needs, wallet, and level of expertise. You may decide on a wired network using ethernet, or a wireless one using Apple's AirPort technology.

## Ethernet

Ethernet has been around for years – it's what you'll find in most corporate networks. Ethernet ports are built into all modern Macs: models including and later than the Quadra 635, Power Mac 5500, and PowerBook 520 (except for the 1400). If you're using such a Mac, you're already halfway there. Most of today's ethernet networks use 10BaseT, a protocol that moves data at 10Mbps. Newer ethernet standards allow transfer rates of 100Mbps or 1,000Mbps (one gigabit). However, it's likely that hardly

anything on your network will work at those speeds, so faster protocols probably aren't worth the extra expense – especially when you consider that 10Mbps is more than enough for several computers to comfortably share an Internet connection.

Still, when you choose cabling, be sure to spend the extra money for Category 5 ethernet cables. These support 100BaseT, so if you decide later to upgrade, you won't have to purchase – or install – new cables. (Gigabit Ethernet, however, will require new cabling.)

**Pros** If you're connecting multiple computers in the same room, ethernet is your best bet. It's fast, flexible, and reasonably inexpensive – and most of your computers should already have built-in ethernet support.

**Cons** Ethernet's biggest drawback is that it may force you to run cables through your walls. Some newer homes come equipped with the proper cabling, but in many cases it's the very prospect of drilling holes and stringing cable that's kept us from linking computers already.

Ethernet is also somewhat more complicated to set up than the ready-made solutions we'll explore; you have to purchase several pieces of hardware and software and get them all working together.

If your computers are scattered throughout your house, connecting them by ethernet makes less sense than it used to.

**Price** A crossover cable to connect two computers costs about £10; a hub, around £30. If you're sharing a broadband connection, you'll

Macworld's guide to creating a networked house of the future.

By Michael Penwarden

continues page 132





**HomePNA – version 2.0 out soon**  
A HomePNA network is a good choice if you have older Macs (pre-AirPort) that will stay in the same location. Bring your high-speed Internet connection into a central location (A), and share it via ethernet (B) with the computers in the room. Connect HomePNA-equipped computers in other rooms to a phone line (C) to add them to your network.

need a combination router and switch called an Internet gateway, which costs about £150.

## HomePNA

The HomePNA standard allows computers to use ordinary telephone lines to move data throughout your home. Proxim's HomeLine Starter Kit, currently the only HomePNA product for the Mac, provides everything you need to connect two computers.

To set up a HomeLine network, simply add the HomeLine adaptors to your computers, plug both your telephone and the line to your phone jack into the adaptors, and then install the included software. You'll still be able to use your telephone without interference, since HomePNA signals (like ADSL) work at a different frequency than voice calls do.

HomePNA networks currently operate at 1Mbps – and fall foul of UK phone regulations. But a new HomePNA 2.0, promising ethernet-equivalent speeds as high as 10Mbps, is due this summer.

**Pros** If you're networking desktop Macs throughout your home and you don't want to run wires through your walls, a HomeLine network is the most affordable way to get connected. Setup is simple; everything you need is supplied. And once products adhering to the new HomePNA 2.0 standard have arrived, HomePNA should be fast enough to meet just about anyone's needs.

**Cons** At present, HomePNA is the slowest networking option – ten times as slow as ethernet – and is unavailable in the UK. Proxim is currently evaluating the market opportunity for HomePNA in the UK.

**Price** in the US, a starter kit for two computers costs between \$100 and \$165; adding more computers costs \$60 to \$90 each.

## AirPort

Apple's AirPort wireless networking technology allows your computers to stay connected when they're within 150 feet of your wireless gateway. AirPort networks offer theoretical speeds as high as 11Mbps, putting them on par with ethernet networks. In the real world, however, AirPort transfer rates are affected by electrical interference and are typically slower.

Because AirPort networks are based on the industry-standard 802.11 protocol for wireless data communications, you can also connect non-AirPort-equipped Macs and PCs to your AirPort network. Just add a device such as Farallon's £45 SkyLine 11Mb Wireless PCI Card, alongside the £122 SkyLINE PC card (0709 226 8906).

If your network has at least one stationary AirPort-compatible Mac, you can set it up as a software base station to control communication among all of your machines (you must leave the base computer running). If all of your Macs are mobile, you'll need to buy Apple's AirPort Base Station to connect them to each other and to the Internet. The base station manages the distribution of data within your network, as well as to and from the outside world, via your ISP. Apple's Base Station includes an RJ-45 connector, for hooking up a cable or ADSL modem, and a standard RJ-11 phone jack connected to a built-in 56K modem.

**Pros** Wireless networks offer far more

flexibility than wired ones do – for you that may mean answering email from your sofa or simply hooking up two machines on opposite sides or different floors of your house.

AirPort is also the fastest wireless network option currently available, and nearly every machine Apple has introduced since mid-1999 (except the entry-level iMacs prior to February's new range) is AirPort ready (with a built-in AirPort antenna).

**Cons** Wireless networks are more expensive to set up than wired networks, since you must purchase wireless network cards and an Internet gateway. Expect to spend about £100 more per computer. And AirPort technology is not compatible with all ISPs, though the newest version (1.3, recently released as an International-English version) supports Dynamic Host Configuration Protocol (DHCP) client IDs.

**Price** Apple's AirPort Card costs £79, and its BaseStation £239 (both prices inc. VAT).

## HomeRF

The third option worth considering is HomeRF, which is available for the Mac in the form of Proxim's Symphony-HRF networking suite (0709 226 8906, [www.proxim.com](http://www.proxim.com)). Like the 802.11 standard, HomeRF operates wirelessly over radio waves, and it uses a wireless gateway to manage communications between computers, as well as with a broadband ISP. It can also work in a peer-to-peer mode, which means that a gateway is not required.

But the HomeRF standard was developed to be compatible with other upcoming wireless devices, too. Already in the US, there are HomeRF voice and streaming-media products available, as well as HomeRF cordless telephones and stereo components.

According to Proxim, USB-based HomeRF products clock in at 1.6Mbps, which is sufficient for most home situations.

**Pros** HomeRF technology can do more than network your home's computers – it also extends to other devices in the home. A new HomeRF 2.0 standard will soon allow 10Mbps data-transfer rates.

**Cons** Current HomeRF products are ten times slower than those based on 802.11.

Another limitation is that the Symphony-HRF Cordless Gateway has only an ethernet connection, so you can't use it with a dial-up connection (as you can with AirPort).

Keep in mind that if you decide to add modern Macs to your network in the future, you'll need to buy HomeRF cards for them as well, rather than taking advantage of the new Macs' built-in AirPort readiness.

**Price** A HomeRF wireless gateway costs £199. Cards for computers cost £99 each.

## Network degradation

All networks degrade as you add more users – but the faster your network is to start with, the better, obviously. Although HomeRF and HomePNA speeds are adequate for most home situations, these users will notice more of a difference when many people are using the network than AirPort users.

But as most home networks host only two or three computers, this shouldn't be too-much of a hardship. AirPort supports up to ten users

# Getting started

Connecting your home isn't like walking your dog – it requires some forethought. To avoid hassles and pitfalls, you'll need to make some decisions before you begin. Here are some things to consider:

**Internet connection** Since one of the benefits of a home network is being able to share a single, high-speed Internet connection, consider what services are available to you, how much you want to spend, and what will work best in your home. ADSL, cable, satellite, and ISDN connections all can be shared through your network.

**Cost** Wired networks are typically the least expensive, unless installation costs get out of hand. Keep in mind that what may seem quicker and more affordable right now could limit you down the road. If you know you'd eventually like to add a PowerBook to your network, for example, going wireless now might be cheaper than setting up a wired network and grafting a wireless one onto it later.

**Speed** How much speed do you need? Are you going to be moving big files or having the whole family surf the Web at once? While all of the products covered here claim current or near-future transfer rates of around 10Mbps, wireless options are more susceptible to signal degradation – and therefore to slower speeds.

**Compatibility** Are you intrigued by HomeRF-compatible devices or other cutting-edge networked technologies? Do a little research to make sure the networking standard you choose will work with the equipment you hope to incorporate later.

**Difficulty** Just because your Macs have built-in ethernet doesn't necessarily mean that an ethernet network is the most straightforward way to go. Be sure to balance the benefits of any particular network against how demanding it will be to set up, operate, and expand. Also, honestly evaluate your pain threshold for things such as IP addresses, subnet masks, and other technical minutia before choosing an ambitious do-it-yourself solution.

**Mobility** Where do you plan to put your computers? If your network includes PowerBooks or notebook PCs, it'd be silly to require them to be plugged into a stationary object to connect with one another. Even if you have two desktop machines in distant parts of your house – upstairs and downstairs, for example – you might be better off wire-free.

per BaseStation. HomeRF supports up to ten users on a single gateway. AirPort, then, is the better choice for larger home networks.

## Networking tips

Now that you've selected the devices you'll use to put your network together, you need an idea of how they'll all work together. Unless you're setting up an ethernet network, much of this work will be done for you: buy a setup kit for the network of your choice, and plug the pieces in – the installation software takes care of the rest. Still, there are some important things to understand and keep in mind.

**Wire it up** If you decide on ethernet, make an honest appraisal of your home-improvement abilities. You'll need to drill holes and measure and lay cables inside the walls, along the outside of your house, or in the crawlspace. If that kind of bloody-knuckle work isn't your bag, check with local electricians – or, better, with an alarm system installer.

**Printer sharing** To share your standard printer among your computers, make sure you have the Printer Share extension in the Extension Folder of all of your Macs; then install the appropriate printer driver on each machine. Open the Chooser, select the printer

you want to share, and then click on the Setup button. When the dialog box appears, select Share This Printer and enter a name for it. If you want to limit access – a good security practice while you're connected to the Internet with an IP-based printer – you can add a password. (To share a USB printer connected to a Mac, you'll need to download Apple's free USB Printer Sharing control panel from the Support area of [www.apple.com](http://www.apple.com).)

**File sharing and security** Macs are relatively safe, but an Internet connection that's always on (such as ADSL or cable modem) can potentially leave a security hole between your home network and the Internet. To protect your network against intruders, open the File Sharing control panel on each computer on your network, and enter a user name and password. Internal security may also be a concern. To prevent your teenage daughter from browsing through your Quicken files (or your dad from reading your email), use a different name and password for each machine.

Now you can use the File Sharing control panel to set the level of access you want each user in your network to have. It's safest to deselect the Enable File Sharing Clients To Connect Over TCP/IP option.



## HomeRF

Consider Home RF if you have older Macs (pre-AirPort), including portables. Bring your high-speed Internet connection into a central location (A), and share it via ethernet (B) with the computers in the room. A HomeRF gateway (C) will let you wirelessly network computers in other rooms (D), as well as HomeRF-enabled products such as a SimpleFi stereo component (E).

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#### AirPort

An 802.11 network is easiest if you have mostly AirPort-ready Macs. Bring your high-speed Internet connection into a central location (A) and share it via ethernet (B) with the computers in the room. An AirPort-compatible base station (C) will let you wirelessly network computers with AirPort cards (D) in other rooms.

## Coming to terms

To be a home networking whiz, you need to talk the talk. Here are a few terms:

**Category 5** This is the type of cable you should use to physically connect an ethernet network. Less-expensive options are available, but Category 5 (or Cat 5) cabling is compatible with both 10BaseT and 100BaseT protocols, so it keeps your future options open.

**Network Adaptor (or Network Interface Card)** No matter which way you go, every machine on your network will need to interface with the group; that's where NICs come into play. Since ethernet is built into most Macs, you won't need ethernet adaptors unless you're using older Macs or unequipped PCs. Machines on HomeRF and AirPort networks also require specific hardware to communicate.

**Hub** A hub is like a traffic roundabout for your data – all data enters it and then goes around until it finds the exit to its intended destination. Hub models have different numbers of ports; for most home networks, four or five will do the trick.

**Router** If a hub is the roundabout, a router is the traffic cop telling the data which computer to head for. Routers can be physical devices, or software if your network has at least one computer that is constantly connected to the Internet.

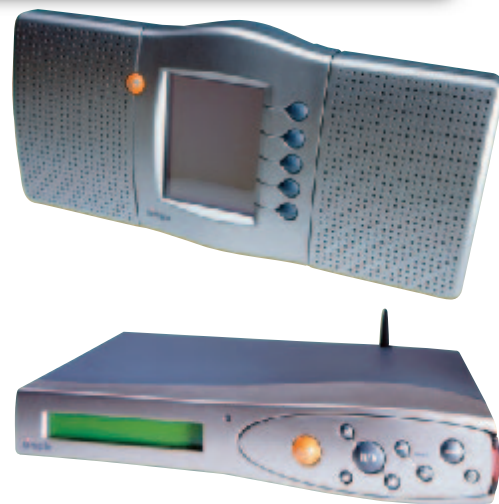
**Gateway** There are routers all over the Internet, busily moving data from place to place. But the router at the "front door" of your network, distributing information among the machines in your house, is called a gateway. Like routers, these can be hardware or software.

**Firewall** Simply speaking, a firewall is a way to keep the bad guys out of your network. In corporations, expensive hardware firewalls are essential to secure the information stored on internal networks. In most homes, though, the threat isn't quite as serious; you can go a long way with software protection or by password-protecting your network's File and Printer Sharing capabilities. Some gateways – such as Proxim's Symphony-HRF Cordless Gateway – include firewall capabilities.

**Crossing platforms** If you need to include PCs in your network, you won't have any trouble hooking everything up. Every option covered in this article is offered in both PC and Mac versions. But to get the most out of a cross-platform setup – so all computers see each other in a way that lets them share files, peripherals, and Internet access – you'll need cross-platform software. To add a PC (or two) to your Mac network, install Miramar Systems' PC MacLAN on the PC, and your Macs will treat it like one of their own. If you're starting with PCs and adding a Mac or two, check out Thursby Software's Dave (£79 ex. VAT; Gomark, 020 7731 7930) or MacSOHO (£70, Gomark), or Connectix's DoubleTalk (£75 ex. VAT; CU, 020 8368 5857; [www.connectix.com](http://www.connectix.com)) – all install on your Macs and let them access PC networks.

### Network savvy

A broadband connection will soon become the standard pipe through which all digital information enters – and exits – your life. Movie sites will allow you to download films you want to watch; telephony features such as voice mail, call forwarding, and video conferencing will be managed by the same service. In short, home networks will no longer be reserved for computing's manic fringe; they're quickly becoming part of the home-computing experience. **MW**



#### RF devices are simple

More devices and capabilities will become available as the HomeRF technology gets faster and gains acceptance. For example, Simple Devices ([www.simpledevices.com](http://www.simpledevices.com)) has announced SimpleClock (which lets you wake-up to Internet radio) and SimpleFi (a stereo component that will use the HomeRF standard to download or stream MP3s from your HomeRF-equipped computer for playback on your stereo system. There are also HomeRF-based robots from iRobot, which enable you to check on your pet's whereabouts while you're at work – or remotely monitor your holiday home. Just access your home computer from your private iRobot Web site to control your iRobot.





# Charting success

Getting to grips with Office 2001. Part Two: Excel. By Nan Barber & David Reynolds

To paraphrase the old saying, a graph is worth a thousand numbers. Fortunately, Excel can easily turn a spreadsheet full of data into a beautiful, colourful graphic – revealing patterns and trends in the data that might be difficult or impossible to see otherwise.

The keys to making a good chart are to design your spreadsheet from the beginning for charthood, and then to choose the right chart type for the data.

Making a chart in Excel is easy – especially if you take advantage of the program's Chart Wizard, a four-screen "interview" that walks you through creating a chart from the data you select.

**Select the data** The first step is to select the data that you want to chartify; you can select the cells worth including, just as you'd select cells for any other purpose.

Although it sounds simple, knowing which cells to select in order to produce a certain charted result can be a difficult task – almost as difficult as designing the sheet to be charted in the first place. Think about what you want to emphasize when you're charting, and then design your spreadsheet to meet that need.

Here are a few tips for designing and selecting spreadsheet cells for charting:

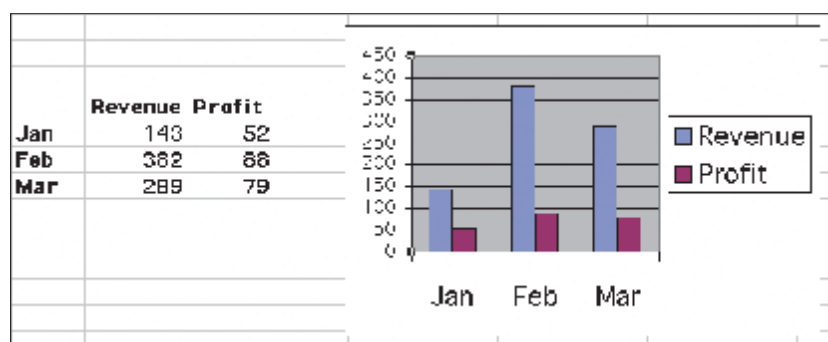
- When you're dragging through your cells, include the labels you've given to your rows and columns. These labels will be incorporated into the chart.
- Don't select Total cells unless you want to see them as part of your chart.
- Give each part of that vital data its own column or row. For example, if you want to chart regional sales revenue over time, create a row for each region, and a column for each unit of time (month or quarter, for example).
- It's usually easier to put the data series into columns rather than rows; we tend to see a list of data as a column. Furthermore, the numbers are closer together.
- Keep your data to a minimum. If you're charting more than 12 bars in a bar chart, consider merging some of that data to get fewer bars. For example, you might

## Understanding data series

If you hope to master Excel charts, you'll have to master the concept of a data series. Put simply, a data series is a group of numbers (or data points), such as quarterly revenues – one row or column of numbers. Excel turns each data series into its own bar, column, or pie wedge of your chart and assigns a different colour to each.

Many charts plot more than one data series, such as a chart that plots quarterly revenues versus quarterly profits. When working with data series in Excel charts, those data series come from the same row or column; in the resulting chart, Excel gives each series a unique colour.

For example, suppose you have a chart with two data series – that is, the numbers begin life as two spreadsheet columns, as shown here. When you create the chart, each month's revenue might show up as a blue bar, and each month's expenses as a purple bar. All of the like-coloured bars came from the same data series. One more tip: When you make a chart from a selection of cells, whichever you have fewer of – rows or columns – becomes the data series. You can always switch this arrangement, swapping the horizontal and vertical axes of your chart, once the chart is born.

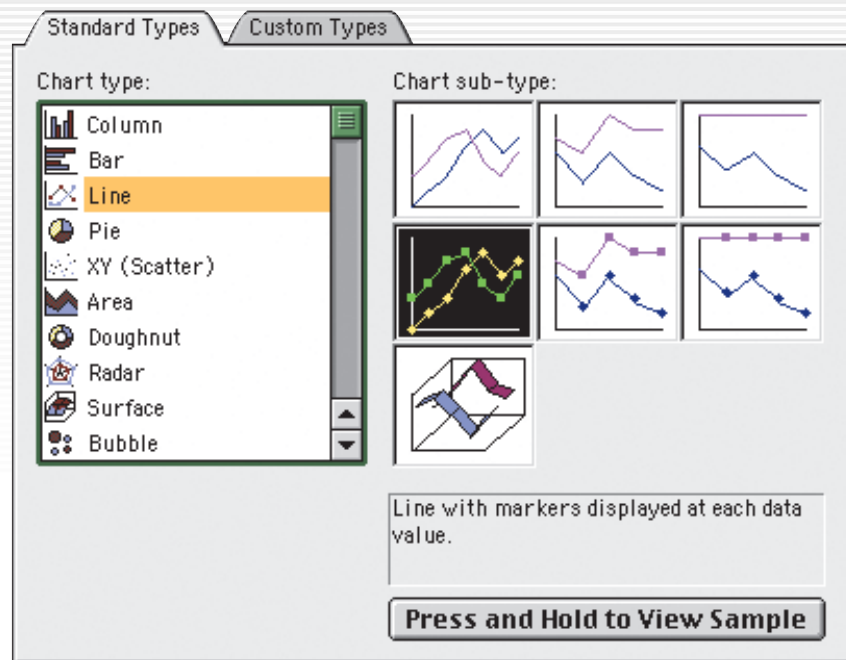


consolidate a year's worth of monthly sales data into quarterly data, which shows four bars instead of twelve.

- Keep the number of data series to a minimum. If you're charting more than one set of data (such as gross revenues, expenses, and profits), avoid trying to fit six different data series on the same chart. Use no more than three to avoid hysterical spreadsheet confusion. (In fact, if you're creating a pie chart, you can't have more than one data series.)
- Keep related numbers next to each other.

*continues page 138*





**Taking a sample**  
When you click the "Press and Hold to View Sample" button without releasing the mouse button, Excel shows you a miniature version of the actual graph you're about to create, using your own data. It's important to use this button to make sure that the chart type you've chosen is the right one for what you're doing. In most cases, you can tell right away if the graph Excel is about to produce looks anything like the one you had in mind.



There's more on Excel charts, and two more chapters on Excel 2001 – 'Basic Excel' and 'Advanced Spreadsheets' in Nan Barber & David Reynolds' Office 2001 for Macintosh: The Missing Manual (Pogue Press/O'Reilly; ISBN: 0-596-00081-2). This article is the second of a series of Macworld extracts from the book, which costs £17.50 from all good booksellers. Next month: PowerPoint.

For example, if you're creating an XY chart, you'll want to create two columns of data, one with the X data and one with the Y data.

■ You can create a chart from the data in non-adjacent cells. To select the cells, hold down the C key while clicking or dragging through the cells to highlight them. When you finally choose Format Insert Chart (or click the Chart Wizard button in the Standard toolbar), Excel knows exactly what to do with the disjointed selection.

**Add more series** In the Step 3 of 4 Chart Wizard, there's a Series tab, which you can use to tweak the data series included in your chart. If things look good, click Next to continue.

**Design the chart** When it comes to customizing your chart, the Step 3 of 4 Chart Wizard screen is the big one. Its six tabs let you change the look of every conceivable chart element, including the chart and axes titles, how gridlines are displayed, where the legend is placed, how data is labelled, and whether the spreadsheet cells used to make the chart are displayed. For example:

■ **Titles** The Titles tab lets you enter names for your chart's title, its axes, and second X and Y axes (if you have them). These names appear as parts of the chart.

■ **Axes** The Axes tab lets you specify whether the X axis is a category axis (whether it displays the label you've given each group of data series), or whether it's a time scale, showing change over time.

■ **Data Table** The Data Table tab lets you choose whether your chart shows the actual data (in a little table below the chart) that was used to build your chart.

Check the preview on the right side of the window to see how your chart is shaping up. Once you've made settings to your heart's content, click the Next button to continue.

**Tell Excel where to put it** The final Chart Wizard screen asks where you to put the chart:

■ **As new sheet** Your chart will occupy a new

worksheet, called a chart sheet, in the current workbook document. This is the option to use when what you really wanted all along was a chart, and plugging in the numbers into a spreadsheet was just a scratchpad for the benefit of the chart.

■ **As object in** You will create an embedded chart – a chart floating as a graphic object right in your spreadsheet. (Use the pop-up menu to identify which spreadsheet page you want to contain the chart.) Use an embedded chart when you want your flashy graphics next to their data source.

Either way, charts remain linked to the data from which they were created, so if you change the data in those cells, the chart updates itself appropriately.

After making your selection, click the Finish button to make Excel place your chart.

**Tweak the chart to perfection** The Wizard is only the beginning. Once the chart has appeared on the screen, hundreds of flexible formatting options are available to you.

## Know your names

Before you begin to redesign the various pieces of your chart, however, it may be worthwhile taking a moment to learn their anatomical names:

■ **Legend** The legend tells you what the chart's elements stand for – its lines, pie slices, or dots. It's just like the legend on a map.

■ **Axes** An axis is the "ruler", either horizontal or vertical, against which Excel charts your data. The horizontal line that forms the floor of the chart is called the X axis; the vertical one that forms the "left wall" is the Y axis.

■ **Axis labels** This term may refer either to the tick mark labels ("January, February, March...") or to the overall label of the horizontal or vertical scale of your chart ("Income, in millions" or "Months since inception," for example).

To modify your chart, you can start with the most urgent matters:

■ Move the chart by dragging it around on a sheet.

■ Delete some element of the chart (such as the legend) by clicking it and then pressing the Delete key.

■ Resize the chart by dragging any of the black square-handles at its corners and edges. (If you don't see them, the chart is no longer selected. Click any blank white area inside the chart to select it.)

■ Reposition individual elements in the chart (the text labels or legend, for example) by dragging them.

■ Convert a chart sheet into an embedded chart (or vice versa) by selecting the chart and then choosing Chart Location, and making the appropriate choice in the resulting window.

■ Rotate a 3D chart by clicking inside the actual graph to produce its corner handles, then dragging one of those corner handles vertically or horizontally – you see a wireframe representation of the chart while you're dragging. When you release the mouse, the chart redraws itself at the new angle that

# Choose a chart style

When you choose Insert Chart, the first screen of the Chart Wizard appears. Your first challenge is to choose the kind of chart that's appropriate for the data at hand; you wouldn't want to use a pie or doughnut chart to show, say, a company's stock price over time (unless, perhaps, it's a bakery).

Here are some of your options, each of which may offer several variations. Examine the illustrations that accompany the following descriptions; each picture reveals which cells were highlighted to produce the charted results shown.

■ **Column charts** are ideal for illustrating the data that changes over time – each column might represent, for example, sales for a particular month. As you'll see in the dialog box when you click Column, Excel offers seven variations of this chart type.

Some are two-dimensional, some are three-dimensional, some are stacked, and so on. (Stacked-column charts let you see totals for subcategories each month – that is, the different colours in each column might show the sales for a particular region; three-dimensional charts can show even more information – sales over time plotted against sales region, for example.)

■ **Line charts** help to show trends over time or among categories. The Line subtype has seven variations; some show the individual points that have been plotted, some show only the line between these points, and so on.

■ **Pie charts** (below, left) are great for showing how parts contribute to a whole, especially when there aren't very many of these parts. For example, a pie chart is extremely useful in showing how each pound of your taxes is spent on various

government programmes, or how much of your diet is composed of, say, pie. The Pie subtype has six variations, including "exploded" views and three-dimensional ones.

■ **XY (Scatter) charts** are common in the scientific community; they plot clusters of data points, revealing relationships among points from more than one set of data.

■ **Area charts** are useful for showing both trends over time or categories, and how parts contribute to a whole.

■ **Doughnut charts** are like pie charts, in that they show the relationships of parts to the whole; the difference is that the different rings of the doughnut can represent different data sets (data from different years, for example).

■ **Radar charts** exist for very scientific and technical problems. A radar chart features an axis rotated around the centre, polar-co-ordinates style, in order to connect the values of the same data series.

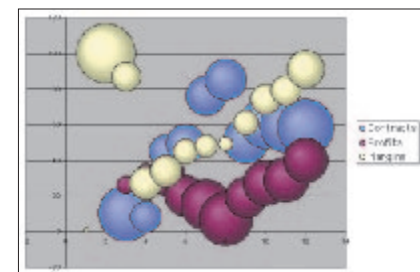
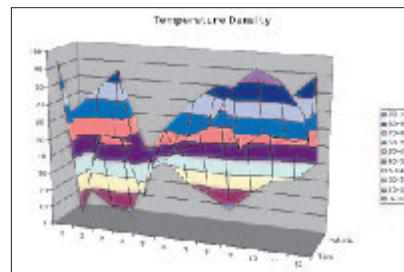
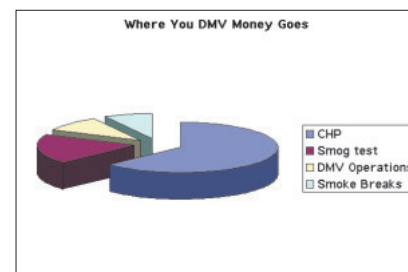
■ You might think of a **Surface chart** (below, middle) as a complicated version of the Line chart. It's good when you need to spot the ideal combination of different sets of data – the precise spot where time, temperature, and flexibility are at their ideal relationships, for example. Thanks to colours and shading, it's easy to see areas within the same ranges of values.

■ A **Bubble chart** (below, right) is used to compare three values; the first two values form what looks like a scatter chart, and the third value determines the size of the "bubble" that marks each point.

■ **Stock charts** are used primarily for showing the highs and lows of a stock price on each trading day, but it's also useful to indicate data, such as rainfall.

■ **Cone, Cylinder, and Pyramid charts** (below, top) are simply variations on basic column and bar charts; the difference is that you get a long, skinny cone, and narrow cylinder, or a triangular spike (pyramid), instead of a rectangular block, to represent each column or bar.

**Note:** If none of Excel's main chart types is exactly what you're looking for, Excel isn't finished with you yet. By clicking the Custom Types tab, you can choose from another 20 chart types, or even define your own chart types.



you specified. Many different specialized Format dialog boxes await your investigation, too; just double-click the pertinent piece of the chart. For example:

■ Change the border or interior colour of the chart by double-clicking within the body of the chart.

■ Change the font, colour, or position of the legend by double-clicking it.

■ Change the scale, tick marks, label font, or label rotation of the axes by double-clicking precisely on their edges.

■ Change the border, colour, line thickness, fill effect, bar separation, and data label options of a bar or column by double-clicking it.

You'll also notice that when a chart is selected, the Formatting Palette offers specialized formatting controls that it borrows from the Chart Wizard; using its pop-up menus, you can change the chart type, gridline appearance, legend placement, and so on. And, if you still haven't found your preferred method of formatting a finished

continues page 140







### Set up rows or columns

On the next Chart Wizard screen, you specify exactly which cells of your spreadsheet you want to graph. If you were wise, of course, you began this entire exercise by highlighting the appropriate cells in the spreadsheet.

But if you forgot, or you're some kind of iconoclast, you can do it now. One way is to edit the contents of the "Data range" field, where the spreadsheet, starting cell, and ending cell are represented with absolute cell references.

The easier way to do it, is to click the tiny spreadsheet icon to the right of the "Data range" field. This icon, wherever it appears in Excel, always means: "Collapse this dialog box and get it out of my way, so that I can see my spreadsheet and make a selection."

This is also your opportunity to swap the horizontal and vertical axes of your chart, if necessary. (The preview on the first Chart Wizard screen should have provided an early warning that you might have your X and Y axes mixed up.)

If that preview looked all wrong, you can swap the horizontal and vertical dimensions of your chart by clicking the Rows or Columns radio buttons, whichever contains the data series.

chart, you can use the Chart toolbar (View-Toolbars-Chart); it offers a pop-up menu that lists the various chart components that you can edit by double-clicking (such as Corners, Floor, Legend, and Series Axis).

**Tip:** You can transfer a chart into another program by selecting the chart, selecting Edit- Copy (⌘-C) or Edit-Cut (⌘-X) and then pasting it into any program that can accept pasted graphics.

### Error bars

On some charts – such as those that graph stocks and opinion polls – it's helpful to graph not only the data, but also the range of movement or margin of error that surrounds the data. And that's where error bars come in. Error bars let you specify a range around each data point that shows up in the graph, such as a poll's margin of error.

To add error bars to a chart, first select the data series – usually a line or bar in the chart – to which you want to add error bars. Choose Format Selected Data Series (or double-click the selected line or bar) to bring up the Format Data Series window. To add error bars along the Y axis – the usual arrangement – click the Y Error Bars tab; in the top section of the dialog box, specify what kind of error bar you want; in the bottom, indicate the amount of error you want shown. Click the OK button to add the error bars to your data series. If you later want to remove your error bar, open the Format Data Series window and set the Display portion of the window to None.

**Note:** You can add error bars to 3D-area charts, bar charts, bubble charts, column charts, line charts, and scatter charts. For scatter charts, in fact, you can even add X-axis error bars. (You'll see this additional option in the Format Data Series window.)

### Trend lines

Graphs excel at revealing trends – how data is changing over time, how it probably changed over time before data was tracked, and how it's

likely to change in the future. To help with such predictions, Excel can add trend lines to its charts. Trend lines use a mathematical model to help accentuate patterns in current data and to help predict future patterns.

**Note:** You can use trend lines only in unstacked 2D area charts, bar charts, bubble charts, column charts, line charts, scatter charts, and stock charts.

To add a trend line to your chart, click to select one of the data series in the chart – typically a line or a bar – and then choose Chart Add Trendline, which opens the Add Trendline window.

This window features two tabs: Type and Options. The Type tab lets you choose one of these trendline types:

■ **Linear** This kind of trend line works well with a graph that looks like a line, as you might have guessed. If your data is going up or down at a steady rate, a linear trend line is your best bet. Linear trend-lines resemble a simple straight line.

■ **Logarithmic** If the rate of change in your data increases or decreases rapidly and then levels out, a logarithmic trend-line is probably your best choice. Logarithmic trend lines tend to have a relatively sharp curve at one end and then gradually level out. Logarithmic trend lines are, of course, based on logarithms, a mathematical function.

■ **Polynomial** A polynomial trend-line comes in handy when graphed data features hills and valleys, perhaps representing data that rises or falls in a somewhat rhythmic manner.

Polynomial trend-lines can also have a single curve that looks like a camel's hump (or an upside-down camel's hump, depending on your data). Polynomial trend-lines are based on polynomial expressions, familiar to those who've spent some time in a secondary-school algebra class.

■ **Power** If the graphed data changes at a steady rate, such as with an acceleration curve, a power trend-line is the way to go. Power trend-lines tend to curve smoothly.

■ **Exponential** If, on the other hand, the graphed data changes at an ever increasing or decreasing rate, then you'd be better off with an exponential trend-line, which also looks like a smoothly curving line.

■ **Moving average** A moving average trend line attempts to smooth out fluctuations in data, which helps show trends that might otherwise be hidden. Moving averages, as the name suggests, can come in all kinds of shapes, and they help to spot cycles in what might otherwise look like random data.

The Options tab, on the other hand, lets you name your trend line, extend it beyond the data set to forecast trends, and even display the R-squared value on the chart. (The R-squared value is a way of calculating how accurately the trend line fits the data; you statisticians know who you are.)

Incidentally, remember that trend lines are just models. As any weatherman, stock-broker, or computer-company CEO can tell you, trend lines don't necessarily predict anything with accuracy.

MW



## how-to:

pdf



# Foolproof PDFs

Make sure your PDF files are bug-free by following some easy rules. By Joseph Schorr

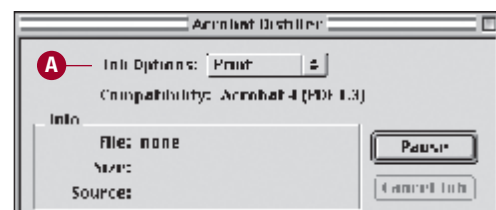
You exert considerable effort perfecting your documents: choosing the ideal font, nudging images into place, and much more. So, when you're ready to share your work with others – whether on the Web or simply with co-workers down the hall – converting the file to Adobe's Portable Document Format (PDF) is the smart choice. Unlike HTML files – which are affected by a viewer's platform, browser, and computer set-up – a PDF file can contain all the required fonts and graphics. As a result, PDFs preserve the look of your original documents with much greater fidelity. To open, read, and print your PDFs, all a person needs is Adobe's free Acrobat Reader ([www.adobe.com](http://www.adobe.com)), which comes installed on most computers.

But creating a PDF that both displays and prints correctly is tricky. It's not uncommon to find headlines displayed in badly spaced Courier font, or richly textured pictures transformed into impressionistic, pixelated graphics.

To avoid these PDF goofs, you must carefully balance competing demands for compact files and high-quality graphics. For this, you need Acrobat Distiller, a component of Adobe's £205 Acrobat 5. Though some programs let you export a document directly to PDF without using Distiller, using the approach we outline here should ensure clean, compact PDFs that are easy to distribute and to read.

2

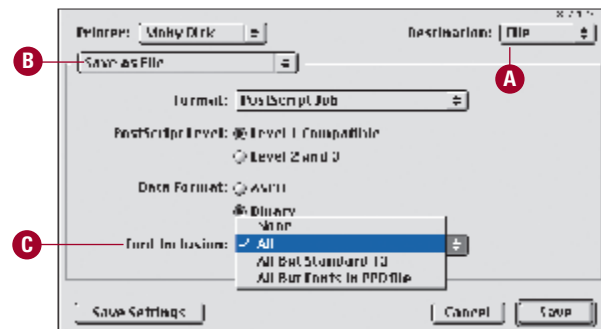
**Tune Distiller's job settings** When a PostScript version of your document is ready, it's time to launch Acrobat Distiller and convert the PostScript file into a PDF. Choosing the correct Job Option setting is critical to creating a good PDF.



From the Acrobat Distiller dialog box's Job Options pop-up menu (A), choose the setting that best matches your PDF's intended use. If you expect people to read your document only on screen, choose Screen. This will compress your PDF to the smallest possible file size. But keep in mind that many people print PDFs – even those on the Web – so it's often a good idea to go with Print instead.

1

**Convert to PostScript** Before you create a PDF, you must convert the original document into PostScript, the computer language used to describe high-resolution text and images for printing. Acrobat can't read Microsoft Word, QuarkXPress, or any other native document format – only PostScript.

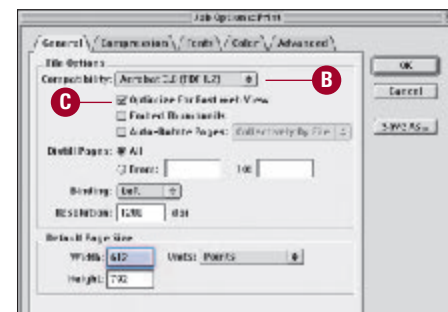


First open the Chooser from the Apple menu and select a PostScript printer, such as LaserWriter 8, as your target device. Since Mac OS ships with the LaserWriter 8 driver, you should have it no matter which type of printer you use.

Open your document and, from the File menu, choose Print. In the Print dialog box, select File from the Destination pop-up menu (A). With this option selected, your document won't be sent to a printer; it can instead be translated into a PostScript file.

Select Save As File from the main pop-up menu (B). Make sure that the Format menu is set to PostScript Job, and select Binary as the Data Format option. Choose All from the Font Inclusion pop-up menu (C); this ensures that all the required fonts will be written directly into the PostScript file. Acrobat can't embed fonts in your PDF if you don't make them available.

When you've adjusted all the settings, click on Save, name the file, and click on OK.

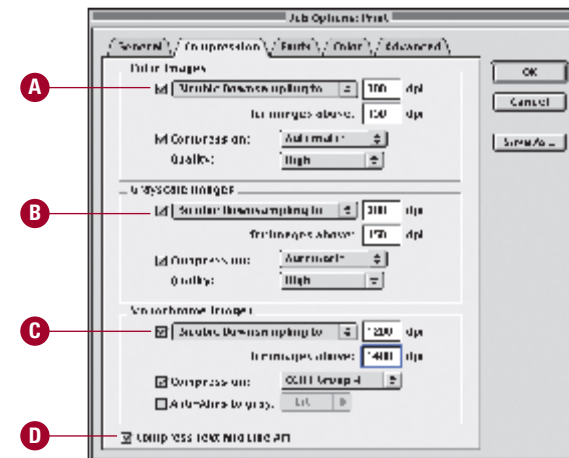


Next, choose Job Options from the Settings menu. In the resulting window, select the General tab. Choose Acrobat 3.0 from the Compatibility pop-up menu (B). This ensures that everyone using version 3.0 and later can open your document.

Make sure that the Optimize For Fast Web View option is selected (C). This makes your PDF smaller and helps it load faster when viewed with Acrobat's Web-browser plug-in.

3

**Take control of compression** All PDFs are compressed to some degree, but the Compression panel in the Job Options window allows you to apply additional compression to various types of images. Uncompressed images result in larger files; too much compression degrades image quality.



Bicubic downsampling automatically reduces the resolution of the images in your document; this can dramatically trim the total file size.

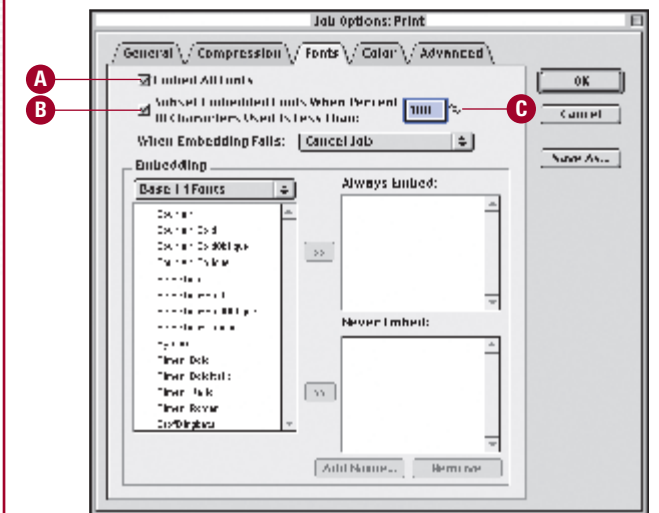
For PDFs that will appear only on screen, it's usually acceptable to downsample all colour (A), greyscale (B), and monochrome (C) images to 72dpi. But if you expect users to magnify your documents when viewing them on screen (to zoom in on a map or a diagram, for example), that setting would make the magnified images horribly pixelated and nearly impossible to read. In such cases, downsample colour and greyscale images to 300dpi instead – or you can turn downsampling off to leave the images at their original resolution.

Similarly, if you want users to have attractive images when they print out your documents, keep the settings at 300dpi. Monochrome images look best at an even higher resolution, such as 600 or 1,200dpi.

Leave the Compress Text And Line Art option (D) selected; it has no effect on quality.

4

**Embed your fonts** One of the best attributes of PDFs, is that they're self-contained: all the fonts and images are wrapped into a single file. But, the fonts won't go along for the ride unless you embed them properly.



Click on the Fonts tab at the top of the Job Options window.

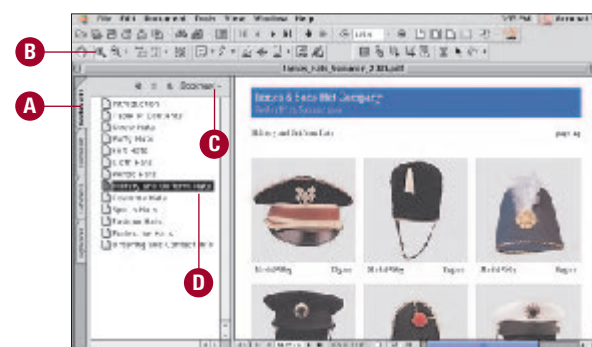
Select the Embed All Fonts (A) and Subset Embedded Fonts (B) options, and set the percentage to 100 (C). This guarantees that Acrobat will display the PDF using only the fonts you've embedded in the file, even if a user's machine has fonts with the same name but slightly different metrics.

Enabling the Subset option also keeps the size of your PDF down, because it allows Distiller to embed only the specific font characters used in the document – not the entire character set for each font.

When you have finished setting your Job options, click on OK. You're now ready to turn your PostScript file into a PDF. You may use Distiller's Open command, in the File menu, to select your PostScript file, or you can simply drag the file into the main Distiller window.

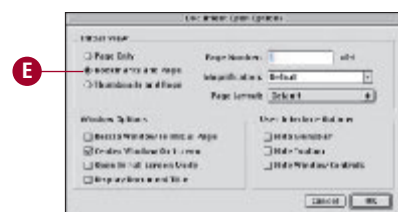
5

**Add navigation tools** Building an effective PDF involves more than just getting the fonts and pictures right. The best PDFs are truly interactive documents, with controls that help readers zero in on exactly the information they need. Including bookmarks and page-view settings with your PDF will make it even more useful to readers.



Open the new PDF in Acrobat and click on the Bookmarks tab (A) on the left side of the screen. Navigate to the page you want to bookmark. Using the Magnifier tool (B), zoom in on the exact portion of the page you want to display. Choose New Bookmark from the Bookmark pop-up window (C) (⌘-B) and type a name in the bookmark's name field (D).

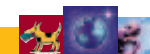
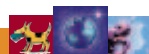
You can repeat this technique to bookmark other pages, pictures, or paragraphs. Each bookmark creates a new link in the PDF's Navigation Pane.



To be sure readers will see your bookmarks, choose Document Properties from the File menu and select Open Options. In the resulting window, select the Bookmarks And Page option (E). Then set the Window

and User Interface options to display what you want viewers to see when they open your PDF.

MW





secrets:

OS X



# Mac Perls of wisdom

Perl scripts will speed  
dull tasks in OS X.  
By Stephan Somogyi

We Mac users have long been proud that we don't have to type in commands to use our machines to their fullest. That's still true, but now that Mac OS X has opened up the Unix command line, we have all the tools necessary to take advantage of some powerful programming and scripting capabilities. Now, our Macs can do more of our odious work. And, after all, isn't that the whole point of a computer?

Programming is a lot like cooking – a category of activities that spans a broad spectrum, from the complexity of sashimi to the culinary travesty of microwaving a pizza. Programming and cooking both can be done at many different skill levels, but

even amateur chefs can make tasty food, just as beginning programmers can create useful scripts. And, like learning to cook, learning to write scripts may appear daunting at first.

In this column, the first of a *Macworld* series looking at OS X's geekier innards, you'll learn how to use the popular scripting language Perl, which is built into OS X. We'll show you how to build a script that converts a Mac text file's line endings to line endings that Unix can interpret. (This will enable the use of Unix-based text-processing tools on the file's contents.) Although developing the script may seem like quite a bit of effort, the results will come in very handy if you ever need to convert multiple text files. We hope that this example will serve as an appetizing taste of OS X's rich flavours.

## Command and conquer

First, you need to fire up a text editor, such as OS X's TextEdit, BBEdit – or, if you're already familiar with the command-line realm, one of the traditional Unix text editors such as pico or vi. Then jump right in by typing the following line:

```
#!/usr/bin/perl -w
```

This first line announces to the operating system that it's dealing with a Perl script. The `-w` at the end of the line tells Perl that it should be particularly stringent about its interpretation of the script, and display warnings if it encounters code that it considers suspect. Get yourself in the habit of adding `-w` to your scripts: doing so will often help you discover and fix scripting problems before they become a pain in the neck.

```
# linebreak characters: \x0d - Mac, \x0a - Unix
```

In this line, `#` indicates a comment for use by the author of the script or someone else reading it, so Perl will ignore the rest of the line. This comment explains the codes for the Mac and Unix line-break characters. Later, outside of the comment, the `\x` notation will tell Perl that we're using hexadecimal numbers to represent line endings.

Perl uses braces `{ }` – sometimes called

“curly brackets” – to group pieces of code. This outermost set of braces in this script is an optional visual indicator of where the script's main part begins and ends.

```
foreach $inFileName (@ARGV) {
```

The script uses this `foreach` loop to work through all the names of files that the script will convert to Unix-readable text. Each individual file name is stored in a separate element of an array – a collection of variables – called `@ARGV`, which Perl creates.

This line translates to “Take a file name from the `@ARGV` array, put it in the variable called `$inFileName`, and run the code enclosed in the following set of braces; continue doing this until you run out of file names in `@ARGV`.” In Perl, all variables begin with the `$` character except arrays (which are preceded by `@`, like `@ARGV`) and hashes.

```
open (INTEXTFILE, $inFileName);
```

This line tells Perl to open the file, whose name it has plucked from `@ARGV`, and create a reference to it, which we've named `INTEXTFILE`. We'll use this reference any time we have to read from this file; Perl wouldn't know which file we were referring to if we didn't name it explicitly.

```
open (OUTTEXTFILE, ">".
```

This line creates the new file that will contain our converted text, and a reference called `OUTTEXTFILE`. The rest of the line contains the file's name; the `>` character is shorthand for “create the file” and doesn't actually affect the file's name. The variable `$inFileName` contains the name of the original file, and the script will add `.converted` to the end of its name (so the original is not overwritten). The periods between the elements of the file name tell Perl to combine them into a single string of text.

```
$textFile = <INTEXTFILE>;
```

This statement tells Perl to read the entire text file from `INTEXTFILE` and put it into the variable `$textFile`. Make sure the file isn't too big (larger than about 100K); even though OS X has Unix-style virtual memory, you can't assume that exorbitant amounts of memory are available.

This line does all the real work in the script and is consequently rather dense:

```
$textFile =~ s/\x0d/\x0a/;
```

Perl has a built-in search-&-replace function, represented by `s`. When invoking this function, you specify what it should search for and replace with; these two strings are bounded by `/` characters. We want to replace Mac line-ending characters with the Unix ones, so those are the two strings we've used in the search and replace fields. Using `~` tells Perl to perform the search and replace on the contents of `$textFile` and then put the result back into `$textFile`.

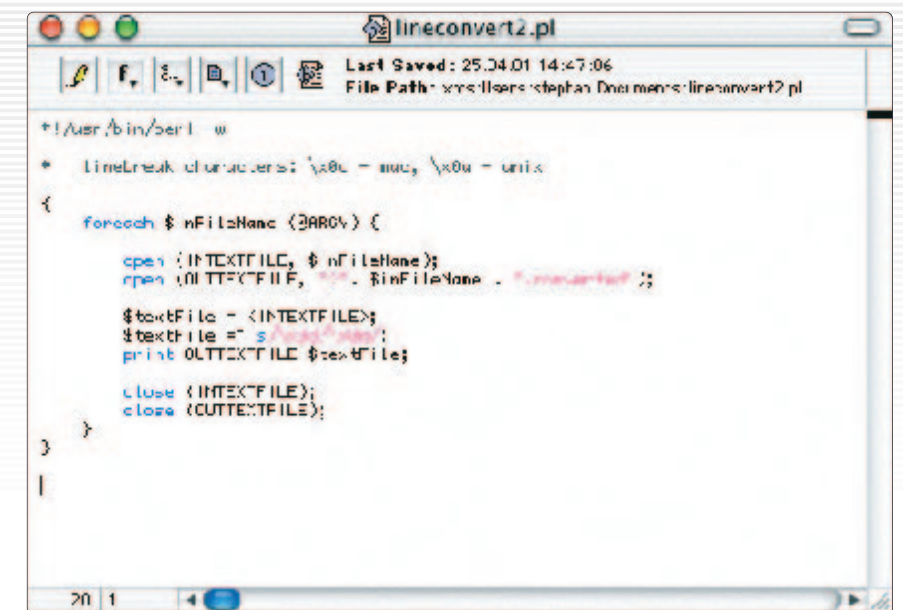
```
print OUTTEXTFILE $textFile;
```

Once the conversion's done, use the `print` function to write the contents of `$textFile` to your output file.

```
close (INTEXTFILE);
```

```
close (OUTTEXTFILE);
```

These final statements close the input



and output files, to keep things tidy. Add two closing braces to end your bracketed chunks of code, and that's it.

When you're done, save this script into a file named “lineconvert.pl” – making sure to give this file Unix line endings. Then use the command line's `chmod` command to set the script's attributes, so the operating system knows it's an executable script. To do this, type `chmod 744 lineconvert.pl` into the command line. (To learn more about the `chmod` command, enter `man chmod` at the command-line prompt.)

Say you have a Mac text file named “mac.txt” and you want its contents to have Unix line endings. You invoke your script by typing `./lineconvert.pl mac.txt` in the command line, and it does the conversion. You end up with a file called “mac.txt.converted,” with contents that have Unix line endings. Tada! Now you can modify the script to create a Unix-to-Mac version, for example.

## In error

One of the many features you can add to your script is improved error handling. This is particularly important, because errors outside of your control do occur.

Our example introduces a few of the ingredients in the large and well-stocked kitchen that is Perl programming. And Perl has countless uses beyond changing text files: it can fill the gaps between databases and Web servers to help you create dynamic Web sites. You can even use it to catalogue your MP3 archive.

To explore Perl further, browse CPAN, the Comprehensive Perl Archive Network ([www.cpan.org](http://www.cpan.org)). If you find packages that seem useful, you may want to get your hands on *Learning Perl, second edition*, by Randal L. Schwartz and Tom Christiansen (O'Reilly & Associates, 1997). Using it as your beginner's cookbook, you'll soon be backing-up Perl scripts that save you time, energy and drudgery.

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**Your tip of the month wins an hp deskjet 990c m**  
We reward the tip of the month with an hp deskjet 990c m, worth £279. This graphite colour printer offers amazing image quality and speed, and is bursting with gadgetry and cool extras.



Q&A/tips



- Disappearing GBs • Word pasting • FreeHand files

# Q&A/tips

Handy Mac tips and readers' questions answered. By Christopher Breen

## Hard drive shrinkage

**Q** My hard drive is shrinking right in front of my eyes. I thought I had 3.5GB of available disk space, but my Mac now tells me that I have less than 1GB. What's up?

Bruce

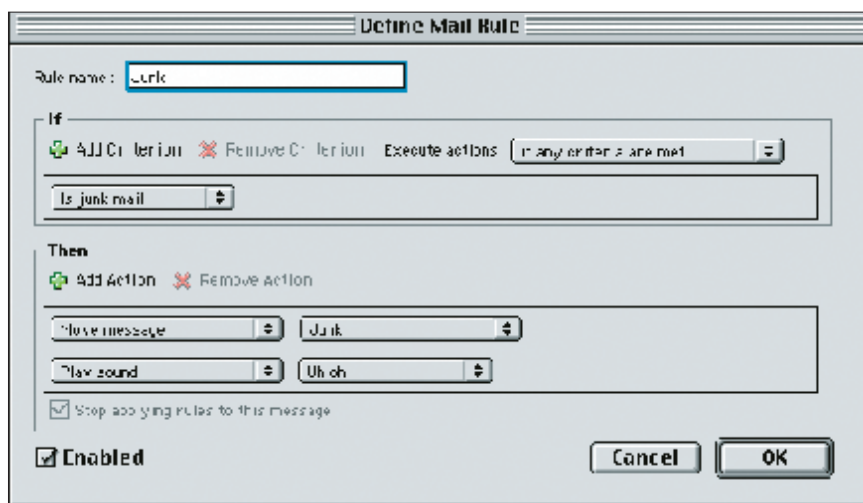
**A** At first blush, this is indeed a scary problem. Thankfully, only a couple of factors can make disk space disappear in this way, and the tools for putting things right are only a download away.

Disk space doesn't just disappear – a file or group of files has scooped up those gigabytes. More often than not, the scoffer in question is some kind of invisible temporary file. Adobe Photoshop 6.0 is notorious for creating enormous temporary files and failing to give them the boot once the application shuts down. Likewise, Microsoft Word and the classic Mac OS (version 9 and earlier) can create – and neglect to dispose of – their own invisible temporary files.

There are a few ways to get rid of these disk-space thieves. You can use Sherlock to find the invisible files on your hard drive and delete them by hand, but I wouldn't recommend it; before I trash invisible files, I want to know a bit more about them. So my first line of attack is SearchWare Solutions' Eradicator ([www.swwsoftware.com](http://www.swwsoftware.com)). This simple – and free – application reveals the contents of the invisible Temporary Items and Cleanup At Startup folders, and allows you to selectively delete files within them. If you'd like more control over what you trash and what you keep, check out MonkeyBread Software's \$15 Ghost Hunter ([www.monkeybreadsoftware.com](http://www.monkeybreadsoftware.com)). Ghost Hunter allows you to see all the invisible items on your Mac's hard drive and to move, trash, and make these files visible from within the program.

Be careful when vapourizing files: unless you know what you're doing, it's best to delete only those files inside the Temporary Items folder found at the root level of your hard drive. And do this only when other applications aren't running – otherwise you could kill a file that another application is using.

If Photoshop 6.0 is overwhelming your hard disk with undeleted temporary files, you should be able to solve the problem simply by downloading the free Photoshop 6.0.1 update (available from



[www.adobe.com/products/photoshop/main.html](http://www.adobe.com/products/photoshop/main.html)).

This update reportedly kills the temp files that Photoshop 6.0 leaves behind.

Finally, there's another possible explanation for your disappearing disk-space. Maybe, like me, you've installed Power On Software's Rewind (£77; Softline, 01883 745 111), a utility that can restore your Mac to a previous state. Rewind causes disk space to disappear when it's updating its invisible cache file. If you leave your Mac idle for ten minutes, that drive space should be restored to the level you set in Rewind's preferences. On a couple of occasions, however, Rewind never did relinquish the disk space on my PowerBook, and I had to uninstall the program to purge its gargantuan database.

## Disc Burner failure

**Q** I can't seem to make my Yamaha CRW8824S internal CD-RW burner work with Apple's Disc Burner. It's on the Disc Burner compatibility list, so what's the problem?

Beth Gorton

**A** I can easily clear this up. The letter S that follows the drive's model number indicates that it's the SCSI model, and despite Apple's claims of compatibility, you won't be able to use Disc Burner's Finder interface to burn data CDs.

As you've no doubt discovered, when you attempt

page 150

## Rule out spam with Outlook Express

**TIP** If you have Microsoft Outlook Express configured to run in the background and check your email at regular intervals, you may be annoyed when you hear the new-mail alert, switch to Outlook Express, and discover that you've just received another piece of spam.

To avoid such false alarms, create a new folder and call it Junk. Next, create a Mail Rule that moves any mail Outlook Express designates as junk mail to this folder. Finally, add a Play Sound action that plays a different sound when a message appears in this folder. When you next hear that sound, you'll know that there's no need to rush to read your mail.

Charles Moon



Software from Hard drive shrinkage can be found on this month's cover CD.





## Tip of the month: Convert FreeHand file names

**TIP** When opening old FreeHand files in a newer version, the file is renamed "<name of file> (Converted)-1". Annoyingly, you have to rename the file to the original, running the risk of duplicating files and costing valuable time as well. Here is a way to convert every old file on your hard disk in one go.

First, you need the shareware utility File Buddy ([www.skytag.com](http://www.skytag.com)) – any version before 5.0 is Shareware. Next, duplicate an old FreeHand file for test purposes. Drag the old File onto File Buddy. You are presented with a dialog box. Make a note of the File and Creator

signatures (A) – they are case sensitive.

Open the new FreeHand program and create any file and save it. Drag the new file to File Buddy's icon, and make a note of the new Type and Creator signatures. Then, open Sherlock. Choose Custom then Edit, then tick File Type and Creator (B), then in caps type the old signatures. Click OK, then Click Find. You should be presented with all the old files on your hard disk that will need updating one day. Select all files & drag them onto the File Buddy icon (C).

Now type into Type and Creator the new signatures (D). Here, you're changing the files signatures, telling the operating system what

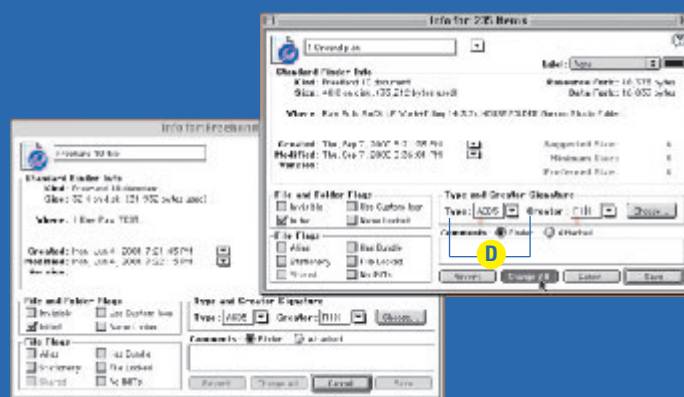
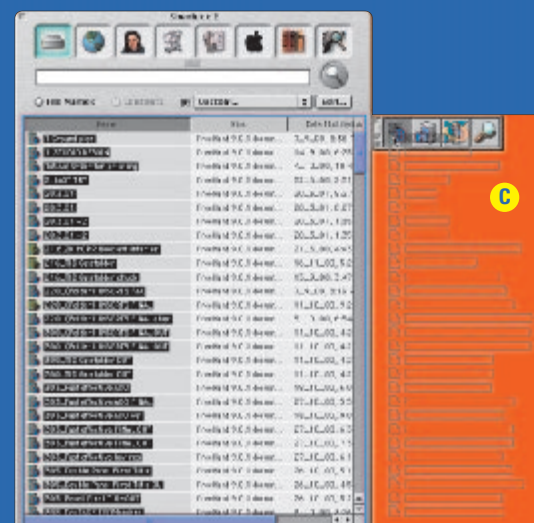
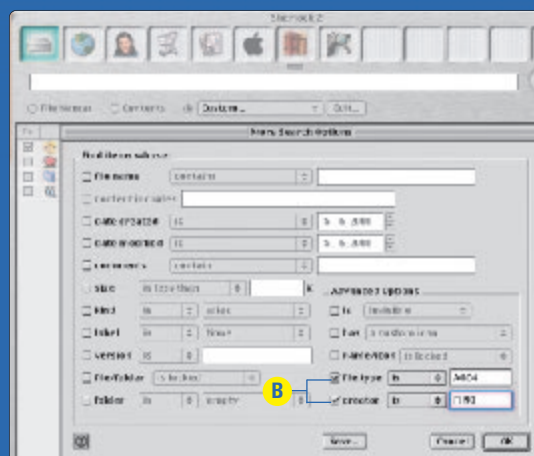
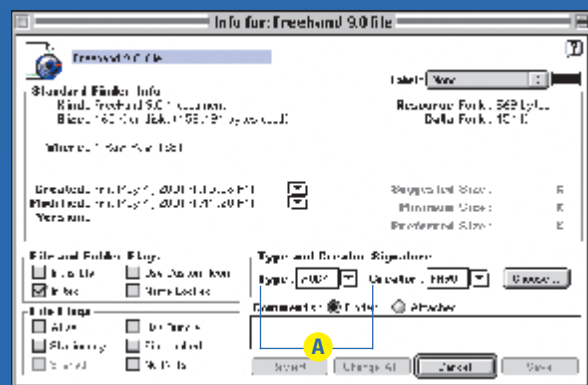
version and what icon to display. Click Change All.

Now all your old FreeHand files are updated in a fraction of the time.

Repeat this for any other FreeHand files set in different versions of the application. This will probably work with many applications.

For those who are not confident about this, a backup would be advisable. I have successfully updated over 600 files in two minutes, saving hours and – more importantly – mistakes.

Duncan Hodges



Macworld's chief sub-editor Woody Phillips and contributing editor Christopher Breen answer readers' questions and select reader-submitted tips for this column. Send your question or tip (include your address and phone number) to Q&A, Macworld, 99 Gray's Inn Road, London WC1X 8UT. You can also send an email, marked Q&A in the subject line, to [qanda@macworld.co.uk](mailto:qanda@macworld.co.uk). We pay £25 for each tip published here. We cannot make personal replies, so please do not include a stamped addressed envelope.

to install Disc Burner on your Mac, an error message waggles its virtual finger and tells you that Disc Burner is incompatible with your Mac. Your SCSI CD-RW drive is sufficiently compatible to burn audio CDs from within iTunes, but for data CDs you'll need to use the copy of Toast that was undoubtedly bundled with your burner.

### Speed up startup

**TIP** Speed up startup times by disabling the startup memory test. Hold **⌘-option** while opening the memory control panel to reveal an extra option

which disables this test. To restore trashed files to their former location, highlight them in the trash and press **⌘-Y**.  
H Palmer

### Slow burn

**TIP** Those attempting to burn an audio CD on a USB CD-RW drive with iTunes 1.1.1 running under OS X 10.0.2 should be sure to burn the disc at a speed no faster than 2x. At higher burn-rates under this configuration, you're likely to run into disc underrun errors, which result in unplayable discs. To choose

## Use Word's Paste Special to banish Web formatting

**TIP** If you've ever pasted text from a Web page into a Microsoft Word document, you've undoubtedly noticed that when you do so, the formatting from that Web page flies in right along with the text you've pasted. To get around this problem, simply choose Paste Special from the Edit menu and in the resulting dialog box, select Unformatted Text.

And, if you routinely face this situation, why not create a Paste Special macro? To do so, select Macro from the Tools menu, select Record New Macro from the Macro submenu, enter a key combination to fire the macro, click the Close button, perform the aforementioned Paste Special routine, and click the Stop Recording Macro button to save your macro.



a burn speed in the OS X version of iTunes, select Preferences from iTunes' iTunes menu, click the Advanced tab in the resulting window, and select 2x from the Burn Speed pop-up menu.

### Easy uninstall

**TIP** When you start afresh with your OS (such as after a reinstall), use the label facility to highlight what was installed in your system folder (or any other folder for that matter).

This allows you to weed out any unwanted preference files or extensions when you uninstall applications, games and so-on.  
Richard Gilham

### Weed out widowed files

**Q** I just got a new PowerBook G4 and would like to use its IrDA port to print to my old HP LaserJet 5MP. How do I set this up?  
Ted Lancaster

**A** It just so happens that a friend who dropped by the house the other day posed the very same question. He had come by to gloat over his new titanium PowerBook G4, and, spying the infrared port that adorns the HP LaserJet 5MP printer sitting in my office, he asked: "Do you suppose I could print from my PowerBook to that printer via infrared?"

Explaining that such a procedure is devilishly difficult to set up, I persuaded the poor sap to leave his PowerBook with me for a few days. After spending those days playing Oni with his Titanium portable and relishing every double punch and flying kick, I realized that if I didn't actually demonstrate how to print via infrared when he returned that afternoon, he'd know I'd hoodwinked him. Here's how simple this operation really is:

Open the AppleTalk control panel and select Infrared Port (IrDA) from the pop-up Connect Via menu. Now launch the Desktop Printer Utility – it's inside the Utilities folder, which is in the Applications (Mac OS 9) folder at the root level of the PowerBook's hard drive. In the New Desktop Printer window, select Printer (Infrared) from the list of printers and click on OK.

Move the PowerBook to within three feet of the printer's infrared port (making sure that the two machines' infrared ports face each other), and click on the Auto Setup button in the resulting window. After a fair bit of cogitation, the Desktop Printer Utility may ask you to select a PPD file if it doesn't

find a native HP printer driver. Select a basic printer description such as LaserWriter, click on OK, name your printer, and save it to the desktop. When you next wish to use this printer, just choose AppleTalk's Infrared setting, point the PowerBook at the printer, and proceed as you normally would.

### Choose your system

**TIP** If you have Mac OS X and OS 9.1 installed on separate partitions of the same spindle, holding down Option at startup allows you to choose which volume to start from.  
Chris Webb

### Mass closure

**TIP** If you have loads of Finder windows open, and you want to close them all at the same time, then hold down the Option and **⌘-W** key and hit the W key. The same effect can be achieved by clicking the close button of a Finder window while holding down Option.

If you want to move an inactive window (of the same application you're in) without making it active click and hold down the **⌘-key** while using the mouse to grab the title bar of the inactive window.

Need to create an alias quickly? Hold down the Option and **⌘-key** then drag whatever you want to create an alias of to where you want it.  
Simon Jones

### QuickTime a sound upgrade

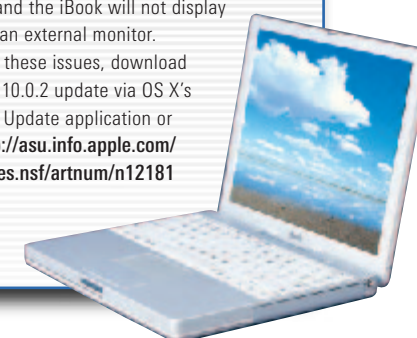
**TIP** If you use MoviePlayer to play MIDI files, you should upgrade to QuickTime 5.0, which includes an enhanced set of instrument sounds.

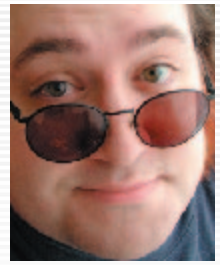
To access these sounds, open a MIDI file in MoviePlayer 5.0 (either the Preview version or the final version included with OS X), and select Get Movie Properties from the Movie menu. Now, select Music Track from the pop-up menu to the left of the resulting window, and Instruments from the pop-up menu to the right.

Select an instrument name (Piano, for example) from the list of instruments that appears and double-click on that name. In the window that appears, click on the Instrument pop-up menu and select one of the instrument names that begins with GS (GS Piano 1, for example). Click OK and you'll hear the new and improved sound.  
MW

### New iBook and OS X

**TIP** If you have one of the snazzy new iBook (Dual USB) models running Mac OS X 10.0.1 or earlier, you'll discover that the F12 key does not eject an empty CD tray, and the iBook will not display video on an external monitor. To rectify these issues, download the OS X 10.0.2 update via OS X's Software Update application or from <http://asu.info.apple.com/swupdates.nsf/artnum/n12181>





# Unwired awake

**“Wonderful things can happen when simple gizmos have the ability to work together.”**



Actually, it was a lot easier than I thought it would be. Open up my sweetheart's coffeemaker, install a mechanical relay to switch it on and off, design and install a light sensor that detects when the Coffee-Ready light turns on. Alter her clock radio's snooze button with some more custom circuits. Wire them both into X10 modules attached to my file server. Write a bunch of AppleScripts to oversee and control the whole mess. Bingo. That's all there was to it.

OK, my sweetie didn't understand it, either. But she didn't care. Now, when she slapped the snooze bar and returned to the Starship of Chocolate Elves, my Mac started her coffeemaker – and when, and only when, the coffee was actually ready, my file server terminated her alarm clock's snooze mode.

It worked flawlessly. She went absolutely nuts for it, and didn't dump me until after I'd added scripts that analyzed, charted, and Web-published her snooze-to-brew performance timeline.

You should get three messages from this tale. First, a geek's expressions of devotion tend to skip right past the trite chocolate-and-flowers stuff. Second, I'm now available. Third and most importantly, wonderful things can happen when simple gizmos have the ability to work together.

Which brings us to Bluetooth. Bluetooth is a standard for wireless connectivity – or in plainer language, it allows devices to use radio to communicate with one another. It's sort of like Apple's AirPort, but on a cozier scale. Bluetooth devices can find each other and link up automatically. You power it up, and bingo – it's talking to other Bluetooth devices.

Bluetooth can manage only a tenth of AirPort's speed. And, while AirPort can communicate across a football field, Bluetooth reaches only about as far as you can throw a paper airplane. But when it comes to simplicity and convenience, Bluetooth's the winner. Right from your pocket, your Bluetooth-enabled handheld device can sync to your computer the moment you step into the office. No connecting cables, no configuration.

People don't really “get” Bluetooth yet, and it's no wonder: Bluetooth's proponents should really be touting it as a simple, low-power, and (hopefully) dirt-cheap way to get devices talking wirelessly.

A Bluetooth-enabled cell phone projects a bubble of network access, 20 metres in diameter, all around itself. If that phone is in your pocket, the PDA in your hand can get email; if that phone is in a backpack in the boot of your car, the hands-free kit can place and answer calls.

About 2,500 companies, from IBM and Microsoft on down, are participating in the development of Bluetooth – but the companies that are not in the geekware business are asking the most interesting questions. What if Bluetooth really does become simple and inexpensive enough to go into familiar appliances? I wouldn't spend £170 on a “Wake Me When the Coffee's Ready” percolator. But I *would* spend an extra £15 for a coffeemaker with Bluetooth.

This is the sort of stuff Bluetooth's backers are betting on – your car reports from the driveway that the oil and petrol are low, baaaad craziness.

But while it's possible to purchase a Bluetooth-enabled phone if you look hard, finding Bluetooth accessories for it is almost impossible. Microsoft has even dropped Bluetooth support from its “No, this time it's as simple as a Mac” rewrite of Windows.

Where's Apple in all this? Playing it safe. It's not going to do anything to prevent Bluetooth from working with Macs, but it's also not particularly interested in encouraging development. This could turn into the same sort of mistake Apple made when it didn't bother to put CD-RW drives in new Macs.

Apple shouldn't see Bluetooth as competition for AirPort, which is gaining broad acceptance. AirPort and Bluetooth complement each other well. Bluetooth is a swinging-seventies technology: casual, cheap, and easy – a quick linkup that gets the job done. AirPort, in contrast, is sturdy and reliable.

And, Bluetooth has the capacity to become the sort of feature that turns a company's customers into its sales force. Anyone who owned a Newton is familiar with the syndrome. If you used a MessagePad 2100 on an airplane, suddenly you were the pope of row 21. It drew people in. And then all of a sudden that thing, that logo was what everyone simply had to have.

Someday, even those people who aren't dating geeks will have alarm clocks that can operate their coffeemakers. It'll be a shame if visitors to their houses ask to see the box that makes all those things happen – and don't see an Apple logo on it. **MW**